The magazine for Sinclair users and Timex/Sinclair users

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SYNC®

May/June 1983

Volume 3, Number 3

BUYERS GUIDE
TO OVER 1200 PRODUCTS FROM OVER 300 SUPPLIERS AND MANUFACTURERS OF PERIPHERALS AND SOFTWARE FOR THE TIMEX/SINCLAIR 1000 AND SINCLAIR ZX81

IMPROVING YOUR COMPUTER:
- Keyboards
- LOAD/SAVE
- Power Supply

EXTENDING YOUR COMPUTER:
- RAMs
- Interfaces
- Boards

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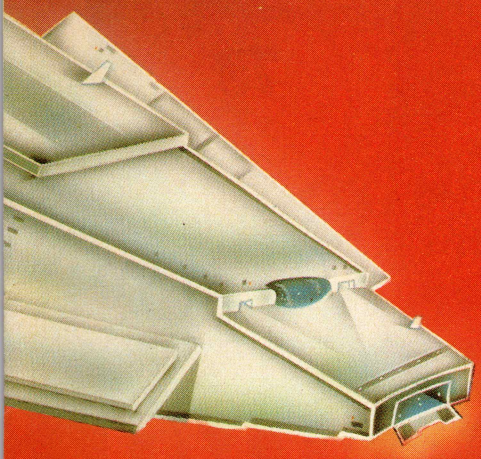

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Original art by Dana Ventura

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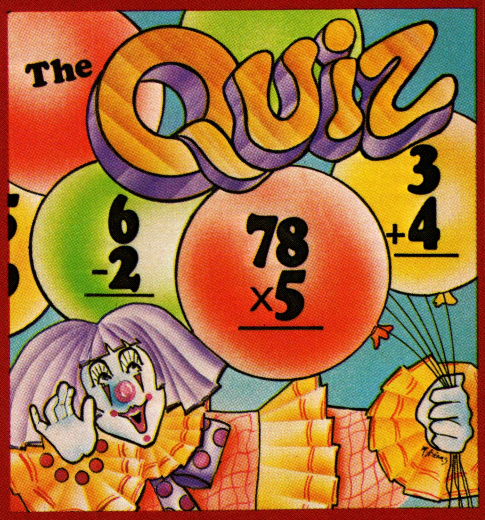

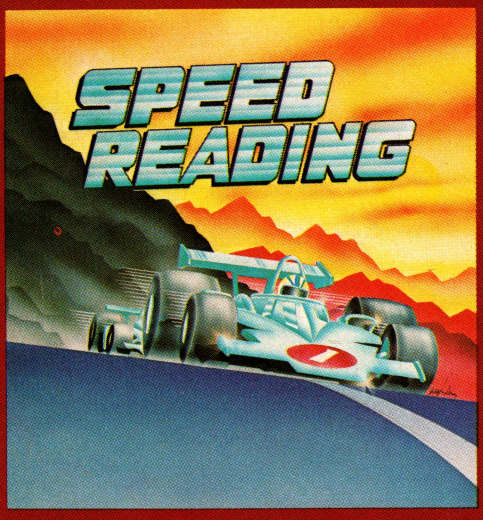

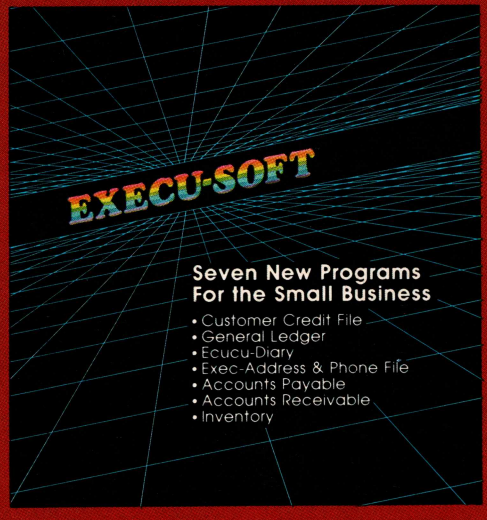

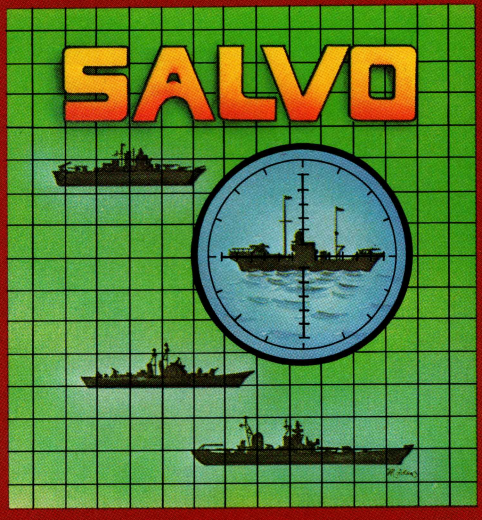

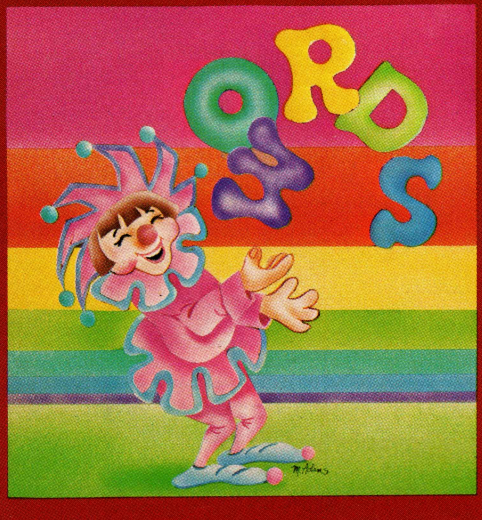

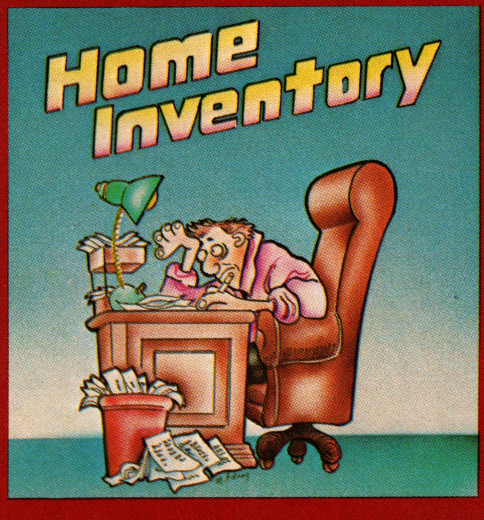

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The Magazine for Sinclair users and Timex/Sinclair users

SYNC

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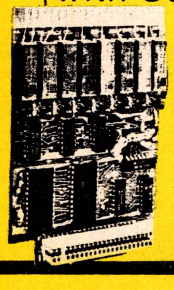

- By using a single POKE command you can change and latch the status of each of the 8 relays.
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sync notes

We hope that this issue of *SYNC* will put to rest the complaints we hear from time to time that there is no support for the Sinclair and Timex/Sinclair computers. The response to our invitation to submit product descriptions has been overwhelming. In fact, we could not include them all in this issue. So our next Resources Column will be a "Buyers Guide Supplement" to complete the listings along with any new product notices we receive.

The following categories could not be included. You can contact the suppliers for further information.

Horse Racing (from CRC, A. Doty, M. H. Marks, 3G, UAS).

Biorhythms (from Fisher-Marriott, Gladstone, Orbyte, Softsync, Syber, UAS).

Astronomy (from Bug-Byte, Gladstone, Kamel, Robert C. Moler, Bob Woish, Z-West).

Hangman (from American Micro, Gladstone, Haymarket, R. Midura, Softsync, Z-West).

Golf (from Asia Tsucho, Computronics, Emvee, Mindware, R. Midura).

Books, publications.

How to Use the Buyers Guide

First, the Buyers Guide is a listing of products and services available for the Sinclair ZX81 and the Timex/Sinclair 1000. It is not a catalog. We cannot guarantee the accuracy, completeness, or timeliness of the information printed. If you see a product that is of interest, we suggest that you make an inquiry of the supplier before sending off an order with a check. Our aim has been to give you as complete a listing of resources as possible with an indication of cost.

Next, the products are arranged in categories. Since some products could easily be listed in several categories, check in more than one place.

The listings follow this format:

1) Supplier's name in bold face type. The suppliers in a given category are arranged alphabetically. All the products from one supplier in a given category are listed together. Consult the Directory of Suppliers for the address. This Directory is arranged in alphabetical order by company name. If the supplier name is a personal name or includes a personal name, the entry should be found under the last name.

2) The product name. Programs and books are italicized. The supplier's number, if any, follows in parentheses.

3) RAM pack requirements are for the ZX81/TS1000. A few products are for the Spectrum and so indicated. The format of the material follows. This was not always clear in the information we received.

4) Prices in dollars, pounds or, in a few cases, Canadian dollars indicated by (Can). Suppliers will usually take checks; a few specified money orders only. The buyer is also responsible for any sales taxes on orders from suppliers from the same state.

5) Shipping and handling. "pp." indicate postpaid. "s&h" means that there is a separate charge for postage, shipping, and handling. This also was not always clear in the information we received.

6) Product description.

Next Issue

The theme section of our next issue will be "SYNC at the Workbench," featuring hardware articles ranging from building a robot to making minor modifications of your computer. We will also include the "supplement" to our Buyer's Guide issue.

The TS1000 for $69.95

Timex announced on March 11 that the suggested retail price for the TS1000 has been reduced to $69.95 and that the rebate program of $15 would continue through April as announced earlier.

Glitchoidz Report

Minotaur, 3:2, p. 80.

The list of variables required is as follows:

Enter in the immediate mode:

LET A=1	
LET B=1	LET L=33
LET C=1	LET O=0
LET D=1	LET P=1
LET E=1	LET Q=2
LET F=1	LET R=3
LET G=1	LET S=5
LET H=1	LET T=20
LET I=1	LET U=31
LET J=512	LET V=128
LET K=16396	LET DN=.3

Do not use RUN to start. Use GOTO 10 (to input density) or GOTO 20 (to use the same density).

Printers

One of the most frequent questions we get is, "What about printers?" In addition to the Sinclair ZX Printer and the Timex/Sinclair 2040 printer, we have received the entries below. We note also that several suppliers are offering interfaces for standard printers.

E. Alvarez
Paper for ZX Printer
3 roll pac for $12 pp.

Paper rolls in exact size for the ZX Printer. Sharp, bold characters on pale metallized stock. Same day service, and economy.

CAI Instruments Inc.
CAI/P40 Printer. $119.95.

The CAI/P40 printer is a 40-column thermal printer that prints all TS1000 and ZX81 alpha-numerics and graphics. Used with either a mini-interface ($20) or the CAI/0 board. Printer has six modes of print: screen dump, print listing, and print string, each of which may be printed in normal or expanded style.

Memotech Corporation
Seikosha GP-100A Printer Package. $399.

The Seikosha GP-100A uses a 5 x 7 dot matrix printing format with ASCII standard upper and lower case character set. Printing speed is 30 characters/second with a maximum width of 80 characters. It uses standard fanfold paper up to 9½ inches wide. The GP100A is offered as a package including cable and interface.

Seikosha GP 250X Printer Package. $449

The Seikosha GP-250X uses a 5 x 8 dot matrix printing format with ASCII standard upper and lower case character set. Printing speed is 50 characters/second with a maximum width of 80 characters. It uses standard fanfold paper up to 9½ inches wide. The GP 250X is offered as a package including cable and Centronics interface.

Mindware Inc.
From Eagle Sales
The MW-100 Printer. $119 plus s&h; includes 5 rolls of paper and any 2 software programs.

The only ZX81/TS1000 plain paper printer available in the U.S. Dot matrix. Uses keyboard printing commands. Standard 1 3/4 inch paper rolls. Ribbons readily available. Needs no interface. Three modes: Mode 0: Prints each 32 character line using 2 lines on the tape for each screen line. Mode 1: Divides the screen in half vertically; prints each; then tape them together for full screen. Mode 3: Prints 16 character lines.

Timex, Sinclair, and the Clones

David H. Ahl

At the Winter Consumer Electronics Show in Las Vegas, there was much fanfare surrounding the official introduction of the Timex/Sinclair 2000. Dan Ross, Vice-President for Computer Products, and the entire Timex crew were there as well as Clive Sinclair and Nigel Searle from Sinclair Research in Britain. On a much lower key, a Sinclair clone and a look-alike that ran Forth were shown by smaller companies.

We've told you about the 2000 (Sinclair Spectrum) in previous issues of *SYNC*, so before looking at the other new hardware, let's hear what Dan Ross has to say about marketing. Today, about 14,000 retail outlets are carrying the Timex/Sinclair 1000; Dan expects that number to increase to 25,000 or more by the end of 1983. Catalog showrooms, toy chains, and bookstores are all in Ross's sight, but he also plans to target other channels of distribution, most notably schools and banks.

By June or July, says Ross, several programs will be instituted between Timex and different banks. He thinks that banks will be rushing to give away the 1000 as a premium for opening new accounts, especially when Timex introduces a $99 modem (expected in the first quarter of 1983).

Ross feels the modem is important because banks are very interested in developing at-home electronic banking services, but the terminal cost thus far has been prohibitive. A computer/modem combination with a list price of $185 could change all that.

Like Apple, Atari, and Tandy, Timex sees the educational market as having a vast, untapped potential. Our opinion is that Timex might be underestimating the amount of software, courseware, and handholding support that is necessary to get into the educational market in a major way. Time will tell.

How many Timex/Sinclair 1000 and Sinclair ZX81 computers have been sold? Of course, the number is a moving target, but as of the end of 1982, our best estimate is 600,000 Timex/Sinclair 1000s, and about the same number of ZX81s, although only 200,000 of them are in the United States.

Does that make the Sinclair the best selling computer in the world? We think so, and Clive Sinclair and Dan Ross certainly agree. However, both Commodore and Texas Instruments also claim to be number 1 in sales. Commodore people were telling everyone in sight at CES that they had produced one million Vic 20's, while TI people were just saying the 99/4A was the best seller, period. No matter who you believe, 1983 should shape up to be a most interesting year.

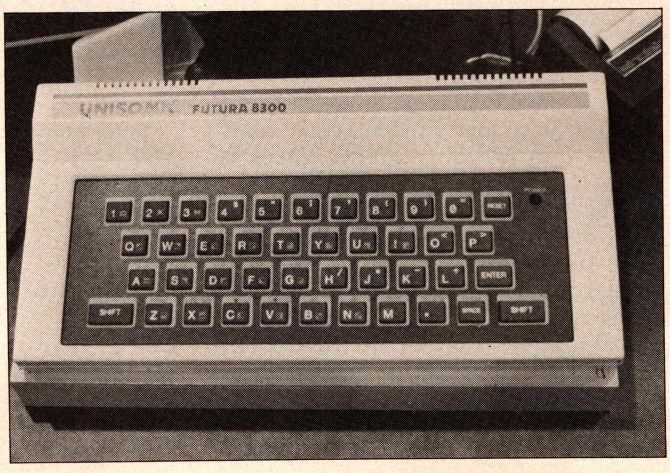
This year will be interesting for many reasons. First, with *Time* magazine endorsing the personal computer as "Machine of the Year," the home computer gained respectability and urgency in the minds of millions of consumers. Second, as more people enter the market as consumers, volume goes up and prices come down. But beyond the effect on prices, more customers mean that manufacturers will offer a wider diversity of peripherals, software, and applications.

In addition to the many new peripherals and software packages at CES of interest to Timex and Sinclair owners, two new computers were announced. The first was a clone of the Timex/Sinclair 1000 with the main difference being a "real" keyboard. Well, it doesn't exactly have a typewriter keyboard, but rather little rubberized "Chiclets." Dubbed the Futura 8300, it was being shown in the Unisonic booth.

I spoke with the Chinese designer of the Futura and asked him if the Basic was licensed from Sinclair. All of a sudden, his English seemed to falter, but he quickly recovered, shrugged and asked why it should be licensed. Why, indeed? I'm not sure, but it seems to me that it should be.

The Jupiter Ace

The Timex/Sinclair 2000



The Unisonic Futura 8300

I then went to find someone from Unisonic who could tell me when the machine might be marketed, how we could get one for review, and so on. "We don't have anyone to deal with the press," I was gruffly told. "How should I go about getting one?" I asked, reminding the gentleman that we published *SYNC* and *Creative Computing*. "Buy one," he said as he walked away to find someone else to insult. Although Unisonic is a strict orthodox Jewish company and presumably its employees have had a fine upbringing, we have been singularly unimpressed with their courtesy and product support in the past. Thus, we do not have high hopes for the Futura 8300, even at the suggested retail price of $80.

Another computer which also looked like a T/S1000 with a real keyboard was the Jupiter Ace. Unlike the T/S machine, the Jupiter Ace speaks Forth, a powerful language that adherents claim is ten times faster than Basic, four times as compact, and much more flexible.

The Jupiter Ace has a Z80A microprocessor, 3K RAM, a 40-key keyboard with auto repeat, graphics resolution of 64 x 46 pixels (which the designers claim to be equivalent to 256 x 192 pixels), an internal speaker, a cassette interface, and an expansion port for memory and other peripherals.

The machine will be marketed by Data-Assette, 56 South 3rd St., Oxford, PA 19363, (800) 523-2909.

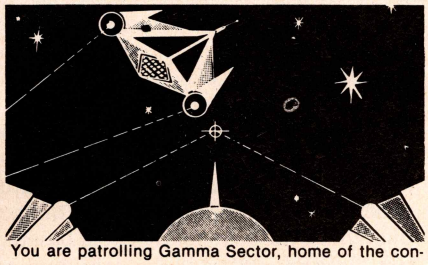
Yes, there was a great deal more of interest at CES and we came home from the show with armloads of literature, decks of business cards, and scores of promises to send products for review. You'll see it all on these pages. ■

letter from england

Stephen Adams

Dear readers by the time you read this, you may have in the shops the Timex/Sinclair 2000 which is your equivalent of the ZX Spectrum.

The Spectrum can have 16K or 48K RAM provided inside the case (the extra 32K RAM chips and decoding can be added to the sockets at a later date). There is no RAM CS connection provided on the expansion port so once 48K is fitted, no EPROMs or extra devices can be inserted into the memory map. As the upgrade is via 32K chips and needs 150ns



ARE YOU READY TO ENLIST FOR THE

PHASER WARS ?

You are patrolling Gamma Sector, home of the confederacy's most remote outpost. Beyond lies the forbidden territory of the Zarons, the most dreaded warriors in the galaxy. Suddenly a Zaron fighter flashes onto your screen, in attach configuration. He's preparing to fire so you'd better think fast! You swing your craft up to adjust your aim but no, he's evading you by peeling off to your left! You follow him down but you see his phasers beginning to rotate. Your computer warns that he is about to fire! You ram your pitch control to the floor and there, for a split-second, he's centered in your sights. The blinding flash that follows confirms your kill! You breathe a sigh of relief. But wait . . . Another Zaron fighter has appeared on your screen . . .

With each Zaron you destroy the pace quickens. And watch out, some of the Zarons are equipped with their new cloaking device! Arcade style game with excellent graphics and action. The computer controls the Zarons and keeps score for two players. Ten skill levels. **16K $14.95**

torpedo attack

This action-packed war game puts **YOU** behind the periscope of your submarine, and half of the enemy fleet between you and your home port! You have only 5 torpedos left and you can't outrun them. You must battle your way through to safety and make every shot count! But, the enemy isn't predictable . . .

Up to 4 submarine captains can compete against each other and the enemy. Aim well! **16K $14.95**

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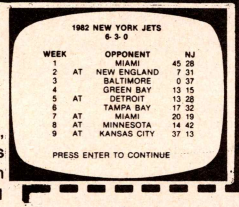

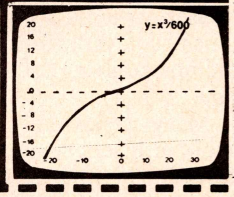

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STEP is a debugging tool that quickly pinpoints BASIC programming errors. **STEP** provides line-at-a-time execution of your programs and allows you to check the display and the values of program variables for unexpected results. Other modes allow breakpoints to be set by line number for quick testing of long programs, by the number of passes for testing loops, or by limits on specified variables.

STEP occupies 3K at the top of your 16K memory and is available as you write and test your program. **STEP** is simple enough to be used by the learner and competent enough for the expert. Detailed instructions include a sample session for quick mastery of program features.

Z-TOOLS

Z-TOOLS is a set of BASIC utilities that enhance your programming power. MERGE programs from your own library of tested subroutines to build new programs quickly. RENUM provides neat listings, includes numbered GOTO's and GOSUB's, and flags those with expressions. COPY and DELETE blocks of lines for quick restructuring. VERIFY the contents of your tape against memory and eliminate losses to defective recording. All functions menu driven and error checked.

Z-TOOLS is a compact 2K and is provided in two versions on one cassette for 16K or for expanded RAM.

SINWARE's other products are those household names **HOT Z**, for cracking the mysteries of machine code, and **Z EXTRA**, for great displays and easy data storage.

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Letter, continued...

type chips, upgrades from other suppliers have been slow in coming, but some now cost £24.50 as against Sinclair's price of £50 (which also requires the computer to be returned to Sinclair). A novel way round fitting extra chips is to add an "ADAM" adaptor which allows the use of a 16K ZX type RAM pack on the back of a Spectrum giving 32K for Basic. The RAM pack cannot be used directly for two reasons: not only is the memory area filled with RAM, but also the top eight address lines of the expansion bus are on either end of a 28 way p.c.b. edge instead 23 way edge of the ZX81. This makes any memory device incompatable and only I/O devices which restrict themselves to the address lines A7, A6, and A5 are useable. Sinclair has extended the number of bits required by his devices to five, so that if any I/O address which has one of the lower bits as Binary 0 will turn on his devices. This is covered in the manual.

The choice of ASCII as the character set has speeded up the production of games etc. for the Spectrum, but the screen display, although memory mapped and controlled by the ULA, is weirdly mapped. This leads to problems when you wish to use the screen with machine code or POKE it directly. The screen itself takes up 6912 bytes of RAM from the basic 16K and the lower half is mapped in dots rather than characters. Each Binary 1 represents an INK color, and each Binary 0, a PAPER color. This explains why there are only two colors allowed per character square. The top half called the ATTRIBUTE file contains the colors for INK and PAPER (out of a choice of eight), plus whether they should be FLASHing, BRIGHT, etc. The attribute file is normal mapped so that character 0,0 is the first followed by 0,1, etc. One of the interesting developments is that the whole character set can be redefined as well as the user definable characters (of which there are 21 A-U). By using a routine included in the "Horizon" cassette which is given free with every Spectrum, various sizes of characters can be made, giving up to 56 characters per line.

Many games etc. use this to squeeze more instructions or characters on to the screen. This and the fact that saving machine code and variables separately on the Spectrum is easy has encouraged programmers to separate their programs into sections to save on memory and make them harder to copy. *Time Gate* by Quicksilva is a good example as the instructions LOAD the program after the user has read them. This enables the full use of memory in this adventure type game. Games mostly seem to be based on *Pacman*, *Frogger*, *Space Invaders,* and *Asteroids* at the moment.

Having machine code so easily available, a lot of companies have come out with assemblers and disassemblers as well as monitors for the Spectrum. One of the best disassemblers is SPDE from Campbell systems and one of the best assemblers is ULTRA VIOLET from ACS. Pascal and Forth should just be a short time behind. Also available, but untried by me are two Basic compilers which turn out a machine code version of Basic program which is at least 100 times faster. These are available from PSS and SOFTEK.

The tape interface works at 1500 BAUD on the Spectrum and is very reliable. It has, however, one disadvantage over the ZX81 in that the cassette leads have to be constantly plugged in and out as feedback from the tape recorder stops a program or data being SAVEd properly. To stop this the EAR lead *must* be disconnected during SAVEing. This has led to the more common use of a cassette switch which allows you to disconnect one lead as well as amplify the rather weak BEEP sound effect from the Spectrum. Abacus does one if you are interested, and there is a programmable version available called an RZ1 which also controls the tape motor.

Coming back to the BEEP command for the moment, this only produces one sound at a time and stops all computing while doing it. This has lead to the production of various sound boards based on the AY8910 chip which will put out sounds independent of what the processor is doing. One of the best ideas I have seen yet is to include with it A/D and a set of joysticks plus an amplifier. This is done by Micro Power as a plug on board. It can also amplify the BEEP of the Spectrum if you wish.

Another use of the BEEP loudspeaker is employed by several of the games, that is, of having your Spectrum talk to you. This is achieved only in machine code and can either be reproduced by talking into a microphone and recording the digital signals to play back as speech or by using preprogrammed sounds to reproduce the voice. Both are available, and speech may be available later as an add-on chip.

Games are obviously one use of the Spectrum, but a lot more businessmen are looking at the Spectrum as a first step in computerizing their businesses. There will very soon be printer interfaces for the Spectrum, and Sinclair is launching a word processor soon. This is to go with the promised RS232 interface for a printer. The microdrive controller will be fitted inside the RS232/network interface box and so two boxes will now be required to use the "coming soon" Microdrive which is well over due. The network interface specification, modem, etc. are still to be published. ■

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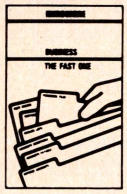

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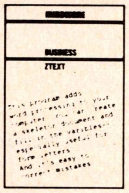

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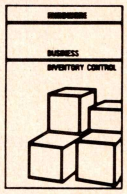

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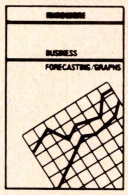

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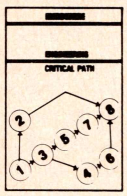

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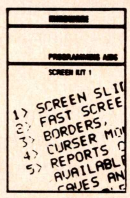

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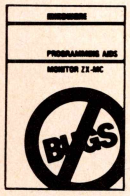

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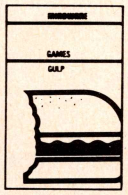

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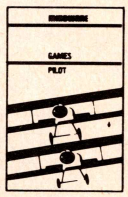

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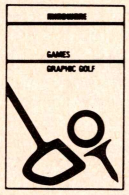

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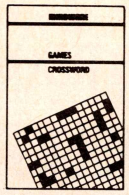

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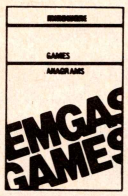

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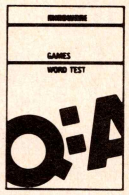

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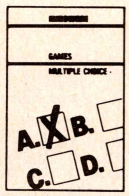

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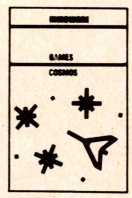

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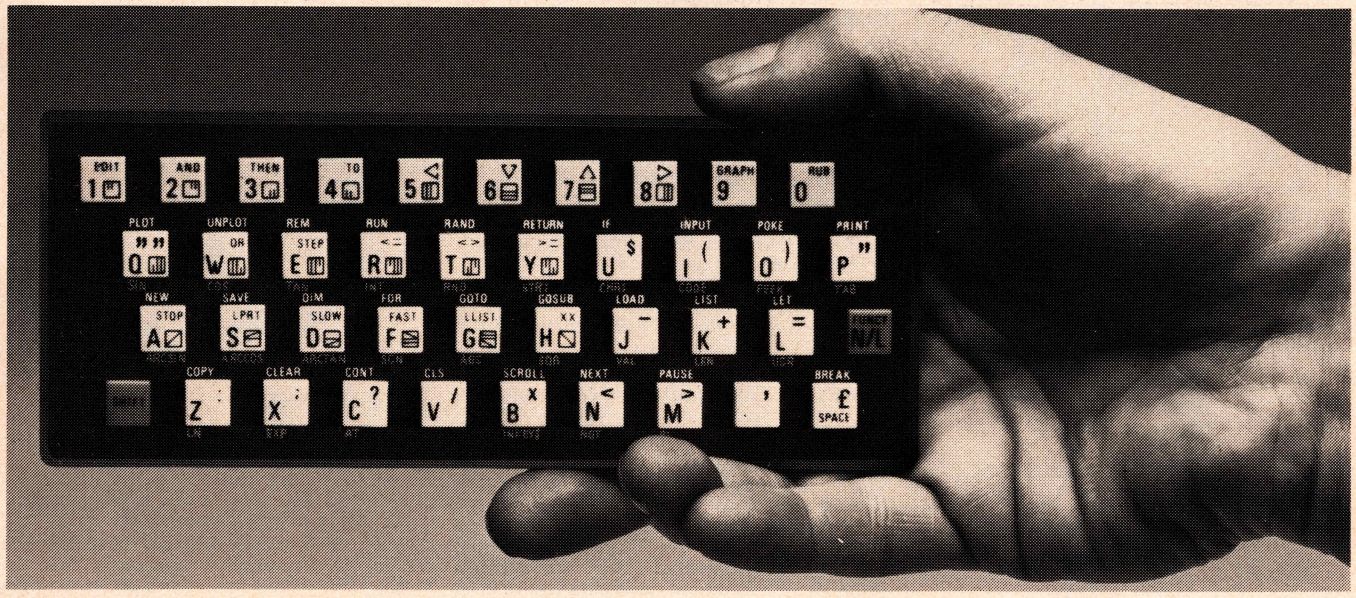

At last there's a really cheap but efficient way of ironing out the TS1000/ZX81's only real bug: its keyboard. The Filesixty Buttonset offers

- A full-travel calculator-type moving keyboard for only $19.50.
- Installed in seconds. The peel-off adhesive backing means you just register into position and press.
- No messy labels, dismantling or soldering.
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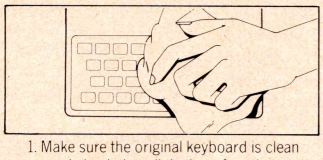
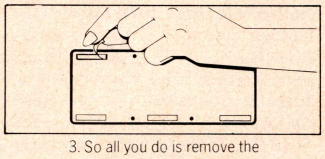
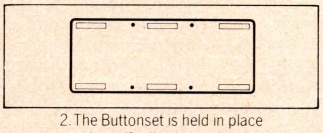
Orders to Filesixty Ltd., 25 Chippenham Mews, London W9 2AN, England. Tel: 01-289 3059. Telex: 268 048 EXTLDN G 4087.



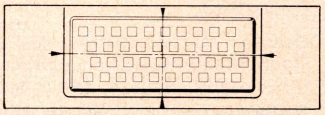
1. Make sure the original keyboard is clean and check that all the keys function.



3. So all you do is remove the protective backing.



2. The Buttonset is held in place by self-adhesive pads.



4. And place it centrally on your TS1000/ZX81.

Cheques/money orders made payable to Filesixty Ltd.

Please send me_____(qty.) Buttonset(s) at $19.50 each (inclusive of postage & packaging).

Total $_____ BLOCK CAPITALS

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USA: SYNC

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TRS-80 COLOR COMMODORE 24 VIC-20 SINCLAIR/TIMEX TI99

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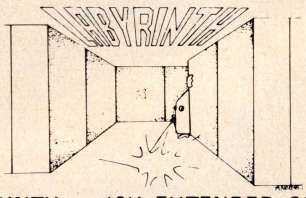
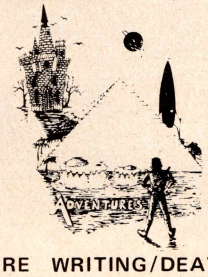
The easiest to use word processor that I know of. Has all the features of a major word processor (right and left margin justification, page numbering, global and line editing, single, double, triple spacing, text centering, etc.) at a very cheap price because we wrote it in BASIC. Includes 40 page manual and learning guide. Easily modified to handle almost any printer combination. Available on disk or tape for VIC20, COMMODORE64, and TRS-80 COLOR computer. Requires 13k RAM on Vic, 16k EXTENDED on TRS-80 COLOR. $19.95 on tape $24.95 on disk. NEW

GENERAL LEDGER — Complete bookkeeping for a small business. Disk required. For Vic20 (13k), Commodore64, TRS-80 COLOR (16k EXTENDED). $69.95 (Send $1.00 for manual before ordering.)



LABYRINTH — 16K EXTENDED COLOR BASIC — With amazing 3D graphics, you fight your way through a maze facing real time monsters. The graphics are real enough to cause claustrophobia.

Similar game for Timex/Sinclair 16k - hunting treasure instead of monsters $14.95.



ADVENTURE WRITING/DEATHSHIP by Rodger Olsen — This is a data sheet showing how we do it. It is about 14 pages of detailed instructions how to write your own adventures. It contains the entire text of Deathship. Data sheet - $3.95. NOTE: Owners of TI99, TRS-80, TRS-80 Color, and Vic 20 computers can also get Deathship on tape for an additional $5.00.

Dealers—We have the best deal going for you. Good discounts, exchange programs, and factory support. Send for Dealer Information.

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ADVENTURES — Adventures are a unique form of computer game. They let you spend 30 to 70 hours exploring and conquering a world you have never seen before. There is little or no luck in Adventuring. The rewards are for creative thinking, courage, and wise gambling — not fast reflexes.

In Adventuring, the computer speaks and listens to plain English. No prior knowledge of computers, special controls, or games is required so everyone enjoys them—even people who do not like computers.

Except for Quest, itself unique among Adventure games, Adventures are non-graphic. Adventures are more like a novel than a comic book or arcade game. It is like reading a particular exciting book where you are the main character.

All of the Adventures in this ad are in Basic. They are full featured, fully plotted adventures that will take a minimum of thirty hours (in several sittings) to play.

Adventuring requires 16k on Sinclair, TRS-80, and TRS-80 Color. They require 8k on OSI and 13k on VIC-20. Sinclair requires extended BASIC. Now available for TI99.

TREK ADVENTURE by Bob Retelle — This one takes place aboard a familiar starship and is a must for trekkies. The problem is a familiar one — The ship is in a "decaying orbit" (the Captain never could learn to park!) and the engines are out (You would think that in all those years, they would have learned to build some that didn't die once a week). Your options are to start the engine, save the ship, get off the ship, or die. Good Luck.

Authors note to players — I wrote this one with a concordance in hand. It is very accurate — and a lot of fun. It was nice to wander around the ship instead of watching it on T.V.

DERELICT by Rodger Olsen and Bob Anderson — For Wealth and Glory, you have to ransack a thousand year old space ship. You'll have to learn to speak their language and operate the machinery they left behind. The hardest problem of all is to live through it.

Authors note to players — This adventure is the new winner in the "Toughest Adventure at Aardvark Sweepstakes". Our most difficult problem in writing the adventure was to keep it logical and realistic. There are no irrational traps and sudden senseless deaths in Derelict. This ship was designed to be perfectly safe for its' builders. It just happens to be deadly to alien invaders like you.

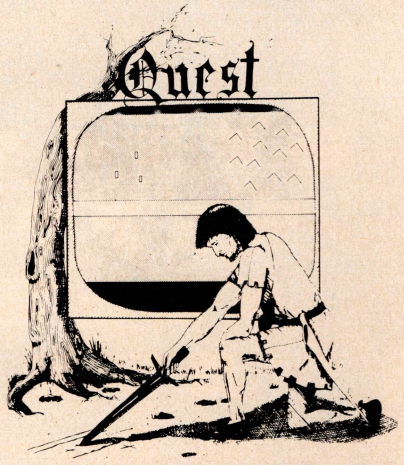
Dungeons of Death — Just for the 16k TRS-80 COLOR, this is the first D&D type game good enough to qualify at Aardvark. This is serious D&D that allows 1 to 6 players to go on a Dragon Hunting, Monster Killing, Dungeon Exploring Quest. Played on an on-screen map, you get a choice of race and character (Human, Dwarf, Soldier, Wizard, etc.), a chance to grow from game to game, and a 15 page manual. At the normal price for an Adventure ($14.95 tape, $19.95 disk), this is a giveaway.

PYRAMID by Rodger Olsen — This is one of our toughest Adventures. Average time through the Pyramid is 50 to 70 hours. The old boys who built this Pyramid did not mean for it to be ransacked by people like you.

Authors note to players — This is a very entertaining and very tough adventure. I left clues everywhere but came up with some ingenous problems. This one has captivated people so much that I get calls daily from as far away as New Zealand and France from bleary eyed people who are stuck in the Pyramid and desperate for more clues.

MARS by Rodger Olsen — Your ship crashed on the Red Planet and you have to get home. You will have to explore a Martian city, repair your ship and deal with possibly hostile aliens to get home again.

Authors note to players — This is highly recommended as a first adventure. It is in no way simple—playing time normally runs from 30 to 50 hours — but it is constructed in a more "open" manner to let you try out adventuring and get used to the game before you hit the really tough problems.



QUEST by Bob Retelle and Rodger Olsen — THIS IS DIFFERENT FROM ALL THE OTHER GAMES OF ADVENTURE!!!! It is played on a computer generated map of Alesia. You lead a small band of adventurers on a mission to conquer the Citadel of Moorlock. You have to build an army and then arm and feed them by combat, bargaining, exploration of ruins and temples, and outright banditry. The game takes 2 to 5 hours to play and is different each time. The TRS-80 Color version has nice visual effects and sound. Not available on OSI. This is the most popular game we have ever published.

32K TRS 80 COLOR Version $24.95.

Adds a second level with dungeons and more Questing.

PRICE AND AVAILABILITY:

All adventures are $14.95 on tape. Disk versions are available on VIC/COMMODORE and TRS-80 Color for $2.00 additional. $2.00 shipping charge on each order.

Please specify system on all orders

ALSO FROM AARDVARK — This is only a partial list of what we carry. We have a lot of other games (particularly for the TRS-80 Color and OSI), business programs, blank tapes and disks and hardware. Send $1.00 for our complete catalog.

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KD-81 Keyboard. $69.95 plus s&h.

41 keys, shift on both sides, space bar. Black case of high impact plastic. 10.75 x 7.25 x 2.125 inches. Key legends silk-screened in 2 colors.

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Abacus Electronics.
Abacus Controller for TS1000. $24.95.

Developed to eliminate tedious swapping of plugs when LOADing and SAVEing programs on cassette. Single switch selection of TALK, SAVE, CUE, and LOAD modes. Built in microphone speaker for fast and reliable program naming and cueing.

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AB Engineering
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Eliminates cable changing, aural transducer permits accurate load level adjustments. Includes power switch, LED indicator, SAVE/LOAD switch, and LOAD monitor. Highest quality parts throughout.

Stephen Adams
The RZ1 tape controller
ZX81 or Spectrum (state which)
£25 Basic model; £30 two relay.

The RZ1 allows control of the SAVE and LOAD leads as well as the tape motor for one or tape recorders. Relay isolation from the computer allows control of 110 volts AC 1 amp from the unit. Also has a built in 5 bit port, (6 if only one motor relay fitted). Uses no RAM or I/O address, completely invisible! Outputs can be used for BANK switching (diagram provided). Very useful for word processing and data logging.

Advanced Interface Designs
Z-XLR8
16K RAM and up. Cassette: $9.50 plus $1.50 s&h.

A fast LOAD/SAVE program. Will LOAD and SAVE 6 to 10 times faster. Fast array variable LOADing and SAVEing independent of program. Fast binary data LOADing and SAVEing anywhere in RAM. Prompts. No hardware changes. Occupies less than 2K RAM.

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A fast LOAD/SAVE EPROM. Will LOAD and SAVE 6 to 10 times faster. Fast array variable LOADing and SAVEing independent of program. Fast binary data LOADing and SAVEing anywhere in RAM. Prompts. Simple hardware changes. Occupies less than 2K RAM between 14-16K.

CAI Instruments Inc.
CAI/ESF Mass Storage Device. $119.95.

1 - 2 drives. Menu driven; accessible through simple keyboard commands; uses small and inexpensive microcassettes that can SAVE and LOAD programs at 11000 BAUD (compared to 250 BAUD on the TS1000 tape port). A 16K program can be loaded in less than 20 seconds. The CAI/ESF is used in conjunction with the CAI/0 board which allows the user to LOAD programs through the standard tape port and transfer them to the CAI/ESF.

Centronic Inc.
Tape Loading Aid. $30.

Load tapes the first time. Includes LED indicators of voice over, program location, record level, overload. Also provides earphone monitor of tape sound and reset switch for computer. Plugs in between

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The Linguists Are Here!

Announcing LINGO 1 software:

- Two-way translator (e.g. German/English or English/German)
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- Each lesson lasts 15/25 minutes
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- Over 350 words with their translations on each cassette
- For ZX/TS with 16K

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YES, I'd like to improve my foreign vocabulary.
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Each cassette $15.95. Add $1.50 shipping and handling per tape. Illinois residents add 5¼% tax. Allow 2-4 weeks delivery.

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TIMEX USERS

Improving, continued...

computer and tape recorder/power supply. No soldering or modification.

Floppy Disk Systems

The Floppy Disk Interface board is available packaged with various floppy disk drivers to the user's specifications. A standard product will be available by mid-1983.

Floppy Disk Interface
Kit: $114; assembled: $149.95.

Interface to your Shugart SA-400 or equivalent. 35 or 40 track (specify). DOS in 2732 ROM. Compatible with RAM packs. DOS commands include: INITIALIZE, DSAVE, DLOAD, NEWD, DIRECTORY, STAT, READ, WRITE, KILL, CREATE. Loads 8K program in 10 secs.; saves 8K file in 20 secs. with verify. Plugs into expansion bus. Powered by computer.

Cinevision Systems
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Calibrated distortion free tape loading amplifier for all tape machines. Triple LED displays for low, normal, overload. Reliable program loading. Superior to "monitor only" units. Connects between tape player and computer. Long battery power design.

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ZX 99
Uses from 8192 to 10239. $150.

Automatically controls up to 4 cassette recorders; has an RS232C Serial Printer Interface. Built-in USR Commands provides program control over the cassette decks and allows Program Listing or Tape to Tape Copy. User access to all 132 characters of ASCII.

Sharp Cassette Recorders. $35.

Dependable loading and saving of information. Automatic level control. AC/Battery operation. Most successful cassette recorder we have tried.

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ZXVER
2K/16K RAM. Cassette: $8. Custom version for 32K/64K: $10.

Self-running utility program to ensure your program SAVEd amd LOADed correctly. ZXVER creates a 10 byte checksum when SAVEing and verifies the stored code upon LOADing. Custom version order must specify location for the 310 bytes.

Fulcrum Products
Loading Aid. $25.

Removes guesswork from adjusting cassette recorder volume. Plugs in between computer and recorder. Red and green LEDs on optimum volume set. Red LED (only) on means volume too low. Yellow LED on means volume too high. Push button to reset K cursor: $2 extra. Earphone to monitor voiceovers: $3 extra.

Gladstone
ZX99 (D71). $149.95.

Gives software control of up to 4 tape decks (2 for loading; 2 for saving); allows mixing of data files to update and modify. Has RS232C interface allowing direct connection to any serial printer using ASCII. Has its own 2K ROM with functions called by USR; functions can be used in programs or immediate mode.

IPS Fastload Monitor Program (Z61). $19.95.

LOAD and SAVE up to 6 times faster. Package includes 2 programs: Keyboard Monitor and Fast Loader. Both reside at RAMTOP. Fast loader can be used in front of any fast saved tape to enable it to be fast loaded thus there is no need to load the monitor for each load.

G M Harris
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Inserted between the ZX81 and cassette recorder during LOAD. A combination of filters and amplifiers to improve the recorded program signal for reliable LOADing. 7 x 5 x 2.5 cm. In-

10 Programs for the 1K Timex/Sinclair

Includes 3 video games, math and household programs, Las Vegas games and many others. Order No. P-1

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Why buy separate programs for telephone numbers, mailing lists, appointments, etc.? data-base 2x will do it all! Cross-reference supports printer, etc. Use for any application.

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Just like the famous Atari videogame. Uses machine code for fast action. Record high scores. Kill the centipedes and other insects before they kill you!

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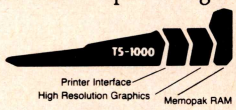
TIMEX MAKES THE COMPUTER, BUT WE MAKE IT TICK.

If you own a TS-1000 or ZX-81 computer and want to bring out the power within it, you'll want Memotech. From easier input to high quality output and greater memory, Memotech makes the add-ons you demand. Every Memotech peripheral comes in a black anodized aluminum case and is designed to fit together in "piggy back" fashion enabling you to continue to add on and still keep an integrated system look.



MEMOPAK RAM All Memopak RAMs are directly addressable, user transparent and are neither switched nor paged. No additional power supply is required. **16K RAM BASELINE** The 16K Baseline is our most economical way to add memory to your TS-1000. It is fully compatible with Memopak 16K and 32K RAMS to provide you with up to 32K or 48K of RAM respectively. **16K RAM** The Memopak 16K RAM offers expansion capabilities through its "piggy back" connection and is fully compatible with Timex or Memotech 16Ks to give a massive 32K of RAM. **32K RAM** The 32K Memopak enables you to execute sophisticated programs and store large data bases and like the 16K RAM is fully compatible with Timex's or Memotech's 16K RAMs to give you a full 48K of RAM. **64K RAM** The 64K Memopak is powerful enough to turn your TS-1000 into a computer with capabilities suitable for business and educational use. It accepts such BASIC commands as 10 DIM A (9000). **MEMOCALC** Memocalc, our spreadsheet analysis software, enables TS-1000 users to perform complex number crunching routines with ease. With the 64K RAM a table of up to 7000 numbers with up to 250 rows or 99 columns can be specified. Quick revisions can be achieved by entering new data to your formula.

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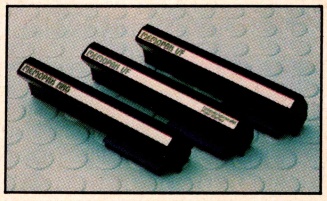
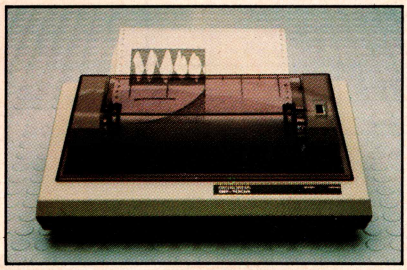


SEIKOSHA GP 100A PRINTER The Seikosha GP 100A uses a 5x7 dot matrix printing format with ASCII standard upper and lower case character set. Printing speed is 30 characters/second with a maximum width of 80 characters. The printer uses standard fanfold paper up to 9-1/2 inches wide. The GP 100A is offered as a package including cable and interface. Other printer packages are also available through Memotech.



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Code:	Price*	Qty.	Total
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16K RAM	59.95		
32K RAM	99.95		
64K RAM	149.95		
Memocalc	49.95		
Keyboard with Interface	99.95		
High Resolution Graphics	99.95		
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Tax (Colorado residents only)			
TOTAL			$

*All prices quoted in U.S. dollars. Prices and specifications subject to change without notice.
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MEMOTECH
CORPORATION

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THE ZX COMPILER

generates a machine code program from one written in an integer subset of Timex/Sinclar Basic

commands/functions

DIM
FOR/NEXT
LET
IF/THEN
GOTO
GOSUB/RETURN
PRINT
LPRINT
PLOT/UNPLOT
POKE
STOP
FAST
SLOW
PAUSE
RAND
CLS
COPY
SCROLL
AND, OR
NOT
ABS
SGN
USR
RND
PEEK
INKEY$
MOD(* *)
AT & TAB

-256 variables (two letter)
-26 single DIM arrays
-16 bit arithemetic
-PRINT & INPUT in hex or decimal
-modulus function
-includes REM generator & code move routines
-hi and lo memory versions (28-32k & 12-16k)

results:
program speed close to hand coded. program size ⅔-¾ original

both versions on one cassette **25.00**

THE ZX ASSEMBLER & DISASSEMBLER

now all machine code.

Assembler resides 26-32k, Disassembler 24-26k

Allows hex or decimal constants, labels, origin, data & comments, source code in REM statements, object code anywhere.

15.00
(cassette)

THE ZX SERIAL PRINTER INTERFACE

plans and listing

RS-232 ASC II output thru MIC port. hardware cost about $10—280 bytes of machine code prints, characters, strings & listings. One connection within case.

5.00

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2. ANIMALS - Popular artifical intelligence learning game

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3. VECTOR MATH - Adds two vectors and provides resultant vector
4. SIMULTANEOUS EQUATION SOLVER - Solves system of simultaneous equations

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1. CHECKBOOK BALANCER - Reconciles check register with bank statement
2. NET PRESENT VALUES - Computes net present value of a series of cash flows
3. AUTO LOAN ANALYSIS - Computes amount of loan and monthly payments

HOME-PAC: ..... ~~$29.95~~ .. $19.95
20 PROGRAMS - Best software value in America. All the programs in the above packages plus:
1. STAR INVADER - Mini space invader game with 1 invader
2. MACHINE LANGUAGE MONITOR - Utility program enters and list hex code
3. RENUMBER - Utility program renumbers BASIC programs
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Computerized variation of popular BOGGLE hidden word game program, with 4x5 game board (2 to 8 players)

GUARANTEED
All programs are supplied on quality cassette tapes which are guaranteed to load and run (defective software will be replaced if returned within 30 days)

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Typical repair charges for a Sinclair ZX81 can run from $25 or $50 up to the replacement cost of the unit. So why take chances? MicroSync will guarantee unlimited service for one year, *parts included,* at one low price. With return postage and handling paid. Plus our VIP treatment for fast turnaround.

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We made over 10,000 Sinclairs tick last year.

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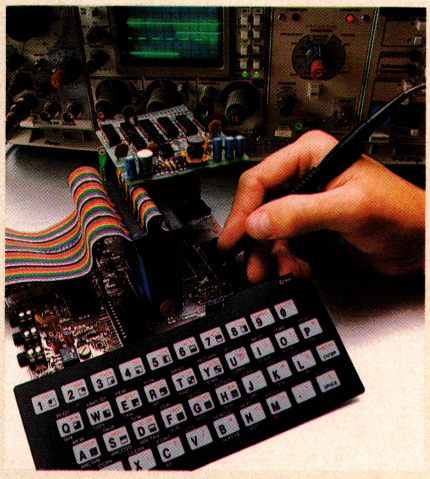

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Less than 90 days old (include proof of purchase) . . . . . **$12.95 ea.**
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The fine print. MicroSync's Maintenance Agreement covers all parts and service for 12 months after the expiration of original warranty. For units over 90 days old, coverage is for 12 months from the date of the Maintenance Agreement. Kits or modified units may require a surcharge. MicroSync may not repair units damaged by abuse or negligence. Liability extends to repair or replacement only.

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NOW SYNERGISTIC OFFERS YOU THE 'SMART™' CHOICE DESIGN

THE ***SYSTEM LOGIC KBD-I***
'SMART™' KEYBOARD ENHANCEMENT FOR SINCLAIR/TIMEX COMPUTERS

All units shipped with silk screened graphics comparable to those of Sinclair/Timex machines. We regret these were not available for *this* advertisment.

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The System Logic KBD-I Keyboard enhancement offers Sinclair ZX-80, ZX81 and Timex TS-100 users an intelligent keyboard peripheral.

A KBD-I allows an increase in user throughput by as much as 70% while reducing fatigue factor errors.

Now enter data and programs quickly without having to 'hunt' for key contacts. Each key produces 'tactile' feedback in addition to employing right-and left-hand 'smart' shift keys. The KBD-I remains in the shifted mode with a *single* keystroke, while exiting from the shifted mode with a second (left or right!) keystroke entry.

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SMART ™ features
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FEATURES

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- Tactile feedback
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- Compact design
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- Auto-repeat function (fast/slow modes)

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Contact resistance: 20Ω @ 1mA
Contact rating: 1.0V/A
Contact bounce: ⩽5.0mSec.
Switch life: 5.0×10^6 operations typical
Switch force: <9.0 oz.
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CHICAGO, ILLINOIS 60641

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Intercomputer Inc.
Qsave (PL7001)
16K RAM.

LOAD/SAVE a full 16K in only 29 seconds (16 times faster). Simply plug the QSAVE amplifier/filter unit between your recorder and the TS1000; all leads are supplied. Then LOAD the QSAVE software before you LOAD a tape or key in a program. A data transfer rate of 4000 plus BAUD compared with only 250 on the standard TS1000, works with 16-64K.

Softbox. (PL7012).

This revolutionary modular box gives instant and easy access to your favorite programs just by turning on the computer. Attaches to the back of the computer. Each of the 4 heavy duty connectors can hold one cartridge. The controller allows instant access to any of these cartridges by entering a simple code. Does not require any additional power supply. Other peripherals, such as extra memory, can be attached on the back of the Softbox.

Softbox Cartridges

Most Intercomputer programs are available on solid state cartridges which plug directly onto the Softbox (up to 4 at a time) or onto the back of the computer (1 at a time). With the control cartridges you can perform different automatic functions as required at your home, office, laboratory or workshop. The cartridges eliminate the waiting for cassette-based programs to load.

Katt's Computers
Back Up Copies
16K RAM. Listing: $3.

Make back up copies of programs. MC loading routine will stop any program after loading enabling the use of the save command.

L & G Enterprises
Level-Vu Prism
$3.95 plus $1 s&h.

The Level-Vu Prism lets you see the recessed tape counter or printer without moving from your seat; fits most recorders; magnifies counter and printer numerals. Specify if for viewing tape counter or printer.

Vu-Load Volume Monitor
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The Vu-Load insures a program LOAD every time. It monitors tape output level; gives a positive SAVE indiction; detects blank tape without disconnecting cassette wires. No wiring required. Instructions provided.

L-Monitor
L-Monitor
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Multipurpose tape loading aid assures first time LOADs. Simple connections (included). Features extremely sensitive, reliable microammeter with sophisticated circuitry; adjustable. Compact and attractive. Output for earphone, amplifier, or duplicating. Comprehensive instructions: normal use, stereo system LOADing, tonal balance, head alignment.

Micro-80 Inc.
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Computer grade cassettes produced by the leading manufacturer in the microcomputer industry. 100% Error-free and fully guaranteed! In use by over 3,000 school districts and software firms

A T/S 1000 "PROGRAM"

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20 **IF** YOU DON'T OWN ONE, BUT ARE EXCITED ABOUT ITS CAPABILITIES AND WANT TO BE INFORMED, **GO TO 30**

30 **GO TO** BOOKSTORE **AND** BUY THE *TIMEX/SINCLAIR 1000 USER'S GUIDE, VOLUMES 1 AND 2*

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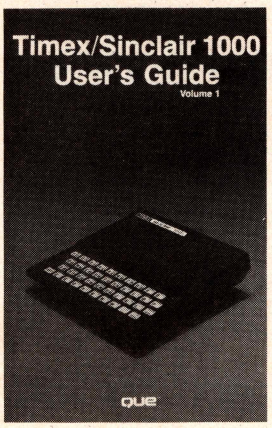

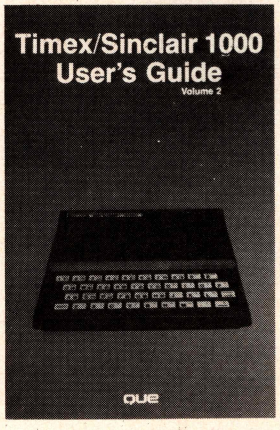

Whether you currently own or are considering buying the T/S 1000, you'll find that these books have *lots of information* and are *easy to understand.* In short, they mean more value for your $ and more exciting uses of your computer.

The books are not only informative, but often humorous, and are loaded with programs, illustrations, flowcharts, and alternatives for accomplishing the most with your T/S 1000. Volume 2 gives information on accessories and games that have been developed for the Timex/Sinclair 1000. Both volumes contain several appendixes that cover a variety of interesting topics.

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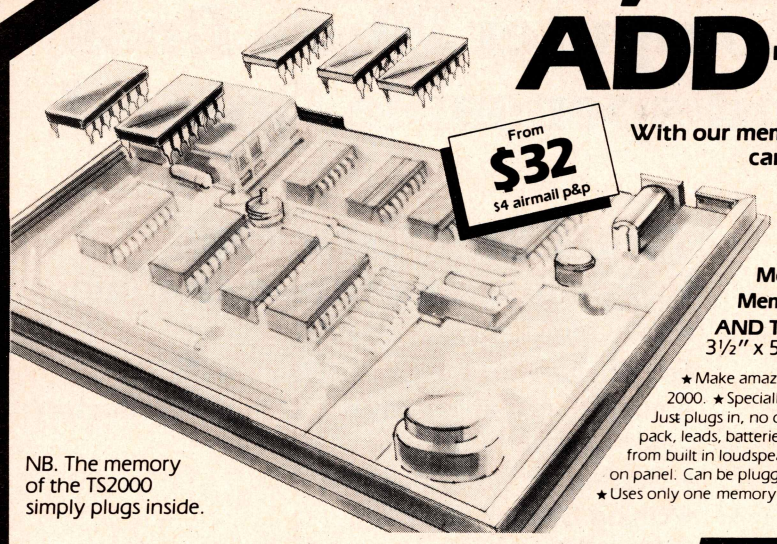

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With our memory expansion add-ons, your Timex Sinclair can increase its capability over and over again.

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Allows user to make backups of favorite programs using only 1 tape recorder. Provision to make multiple backups.

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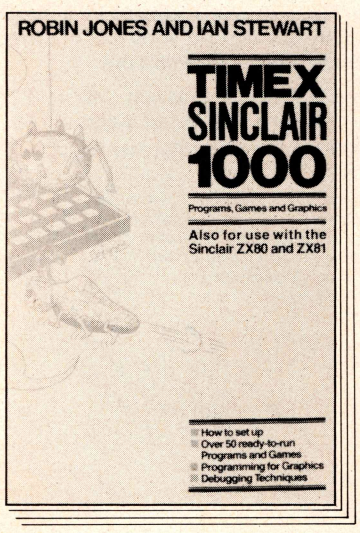

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For the Sinclair 1000, ZX80 and ZX81

A clear, accessible, and *humorous* introductory guide to your computer.

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An introduction to structured BASIC programming and to Machine Code, the language of the Z80 microchip.

Programs include:
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...and even more!

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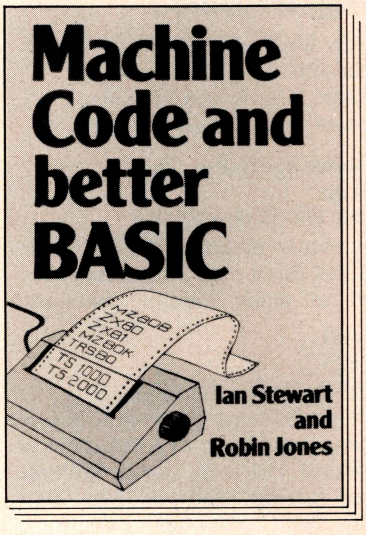

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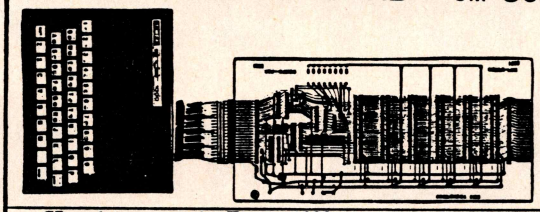

BOARD SIZE 5" x 11"

CBoard converts the Timex-1000 into a complete home computer system. Make a COMPUTING and CONTROL CENTER around your Timex-1000. Applications include Memory Expansion, A/D D/A Wireless Thermostat & Security System. Eprom Programmer Music & Speech synthesis etc.
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64 K RAM	$ 84.95
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Additional power supply. 9VDC, 1A, CSA, UL approved.

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Silences chirper.

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Installation with all parts and labor of: Audiograph Chirper, Auto Repeat Key module, Reset Button, On-off switch for chirper.

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ZXPS/1 is a heavy duty power supply designed for the ZX81 or TS1000 fully regulated. Rated at 1.5 to 2 amps. Made to supply enough power for the ZX81 or TS1000 Computer and any add-on.

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Features plug-in unit, twice the size of its 9 V rechargeable battery, provides a Power/RESET switch, up to 15 minutes of battery back-up, and a power LED (Green for line, Red for battery).

UPSystems
UPSystems; NiCd Backup System.

Compact NiCd powered backup system that kicks in automatically at the slightest drop in voltage coming from the power supply. Just plug it into the microcomputer and you are ready. Includes a Program Loading Monitor (to solve program loading problems), an On/Off/Reset switch, NiCd and additional cords. ■

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Now Timex brings you a printer to go with your Timex Sinclair 1000™ or Sinclair ZX81.

The new Timex Sinclair 2040.

32 columns wide. Two lines per second. With full graphics and text capability based on a dot matrix print mechanism.

The price: just $99.95.

The TS 2040 operates silently in two different modes:

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A printer that can give you a permanent record of your computer programming at a very affordable price.

Just what you'd expect from Timex.

TIMEX COMPUTERS

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Timex/Sinclair 1000 **Sinclair ZX-81**

Super-Market

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16K RAM Pack $39.95

16K Ram Packs (while they last) $39.95
Direct from England

Kayde Keyboard $74.95

Full-size Keyboard from Kayde $74.95
Includes repeat key, easily installable

Graphics ROM $59.95

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The solution to the TS ZX-81. Fits inside the computer and replaces the ROM with graphics of 450 different types. The unit also-has space for 4K of additional ROM or 2K of Ram.

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Hi-Resolution Software from Kayde $19.95 or $49.95 pack of three. Peckman, Space Invaders, Centipede: Quoted the best moving graphic games on the Sinclair ZX-81.

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Did you know that the TS 1000 and ZX-81 can use conventional printers? Now discover the real power of the computer.
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RAM Pack Anti-Wobble. £6.

A metal clamp that completely eliminates RAM pack wobble. It includes the capacity for printer and other equipment. No screws or glue required and completely removeable with no trace. No soldering or electrical experience necessary to fit. Cheaper than ribbon cable and more reliable.

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SIN16 a 16384 byte RAM for the ZX81 or TS1000 computers. Fully compatible with all Timex/Sinclair products. Efficient design allows SIN16 to use little power which leaves more power for other attachments and reduces heat build-up. Its gold-plated heavy-duty connector disallows "glitches" and the resulting program losses. Complete with a manual, self-test program, display case, 10 day return privilege and 6 month warranty.

Byte-Back Co.
16K RAM Pack (M-16)
Kit: $59.95.
Wired and Tested: $69.95.
M-16 blank PCB: $19.95.

Stacks the M-16 with your Sinclair RAM pack or with other M-16's.

64K RAM Pack (M-64)
Kit: $119.95.
Wired and Tested: $129.95.
M-64 blank PCB: $19.95.

Plugs directly into your computer; allows use of printer; no extra power supply needed; area from 8-16K can be switched out in 2K increments for memory mapped peripherals, PROMs, etc.

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A plug in replacement ROM for the Basic ROM. Redefines the hardware and transforms it into an assembly language programming unit. Offers: Full Screen Editor: 16 shift keys give a word processor feel to control programming. Multi-file System: Declare as many files as you want and they are handled by the Operating System. Total Assembler: Full Z80 mnemonics. Powerful Debug: All the usual commands and more. Hi-Res Graphics: 255 x 144 resolution under program control. And much more. Write for details.

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Downsway 16K RAM Packs are fully cased and simply plug into the rear port of the computer. Needs no extra power supply and is compatible with all accessories for either the TS1000 or ZX81.

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This stand alone 32K RAM Pack will upgrade your unit to a full 32K from the start. Plug compatible with our 32K Plus to upgrade to a 64K. LED indicates "Power On."

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Designed specifically for the TS1000 and the ZX81, the 32K Plus operates in tandem with a 16K to provide up to 48K RAM. Plugs directly into the computer rear port and is compatible with the Data-Assette ZX99. LED indicates "Power On." Uses the computer's power without modification.

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Plug-in module easily installed into the existing 16K Panda case, extending the memory to 32K.

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ALL PROGRAMS NEED 16K RAM

BLACK CRYSTAL Our 1983 best-seller. Take the graphic adventure of your life. Figure out the whole 100K of program as it loads in 7 chapters from two thrill-packed cassettes. Real-time monster battles. Illustrated instruction manual. Big presentation box. (Carnell) $22.00.

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3D DEFENDER "Outstanding...graphics second only to the arcade game" (*ZX Computing*) Watch through your spacecraft window as the 3D aliens attack. On-screen forward radar, plus altimeter, proximity meter, number of shields, score. Use the keyboard as a joystick. Alter the speed of your ship - or of the aliens. (Greye) $15.00.

FROGGER Coming up fast in the charts! The first - and still the best - version of the famed arcade game. Moving cars, logs, diving turtles, alligators - and watch for the snake on the bank! Enchanting graphic frogs. On-screen score, High Score, timing. (DJL) $18.00.

MAZOGS "Just the sort of program to impress your friends. One of the tiny minority of programs which every ZX81 owner should possess". *(ZX Computing)* Such stunning graphics that you'll really believe, you're running through the maze, sword in hand, finding treasure, questioning prisoners and killing mazogs. As you get better, it gets harder: 3 game variations. A best-seller. (Bug Byte) $22.00.

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ZUCKMAN "A fast and interesting game ... has all the addictive features of the original" *Sinclair User).* The first authentic TS1000 Pacman. All machine-code. 4 independent ghosts. High Score and Hall of Fame. (DJL) $18.00.

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Jigsaw 16K RAM Pack
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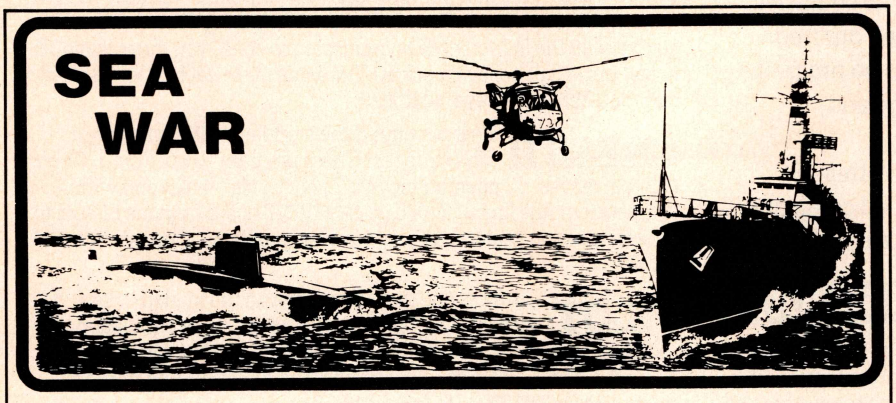
Designed specifically for the TS1000. Plugs directly into the rear port of the computer, and can be used with our own Jigsaw 32K Plus to upgrade to 48K! LED indicates "Power On." No additional power requirements.

DCP Microdevelopments Ltd.
DCP P/A/C Packs. From £20.

P-Pack gives 4K CMOS RAM. A set of packs giving ZX81 memory, control and analogue interfaces. The P-Pack plugs into rear of ZX81/TS1000 and gives 4K of extra CMOS RAM plus I/O Port. The Analogue Pack or Control Pack onto the rear of the P-Pack. Cased and assembled.



SEA WAR
FOR ZX81

This game is designed for one or two players. Each player has three submarines. As a certain number of points are reached, bonus submarines will be given. When the game is going on, the higher the score you get, the more that hostile features will appear on the screen.

The features which appear on the screen are as follows:
Submarine, Warship, U-boat and Helicopter.

Submarine
This feature is under your own control and is loaded at the left hand side of the screen. The keys '9' and '0' are the firing buttons for the upward missiles and forward missiles respectively.

The submarine can be moved in four directions; it can move upwards and downwards by pressing keys '7' and '6' respectively. In order to move forward, you press key '8' and it will draw back to its previous position when you release the button. Also, the submarine can be moved diagonally upwards or downwards by pressing both keys '8' and '7' or keys '8' and '6' respectively at the same time.

U-boat
This is the hostile submarine: It drifts under the sea level randomly, from right to left. Missiles are fired as it approaches your submarine. Destroying a U-boat scores 20 points.

Warship
This is the enemy destroyer which will release bombs diagonally as it drifts on the sea surface from right to left.

The destruction of a warship is done by either firing a vertical missile or, when the submarine is just under sea level, by pressing keys '7' and '0' which release a horizontal missile. Otherwise the missiles will just pass under the ship bottom. Each destruction of this feature scores 50 points.

Helicopter
As you reach a certain score, helicopters appear on the left hand corner of the screen; they drop vertical bombs as they hover above the submarine. To destroy the helicopters, vertical missiles can be fired by pressing key '9'. Each helicopter destroyed scores 100 points.

*New Game—ADDER—Arcade-type game.
Shoot the numbers as they pass across the screen, but watch your total.

Each game $9.95 plus $2.00 postage/handling
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Panda Software,
51 Elgin Street, Shelton
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Down East Computers
RAM chip 6116P-3. $11.95 plus $3 s&h.

Static RAM, (2K x 8). With instructions for upgrading 1K ZX81 to 2K.

EPROM Services
8K EPROM Board. $31.

Allows up to 8K of EPROM or RAM in 2K blocks to be added in the 8/16K ZX81 memory map. Supplied with EPROM I which contains 40 toolkit type routines, e.g., scroll up/down/left/right, free memory, renumber program length. A range of 2K EPROMs to fit this board are available at £10 each: Rapid LOAD/SAVE, MC Monitor, Disassembler, Graphics.

I/O Board (Port). $25.

A 32 line I/O board. Port mapped to 4 absolute locations. Port A has 8 LED indicators. Port B has 8 outputs. Splits into 2 ways each so one instruction can be used to switch between two peripherals. Port C is uncommitted. A status indicator ($9) gives a 16 LED indicator of the state of Port B. A precision D/A board ($15) fits Port C.

Graphics Generator. $39.

A peripheral enabling alternate character sets to be used and printed either from EPROM or UDS in RAM. 4K of EPROM is supplied containing 4 character sets and routines to define print, copy, LPrint, and switch between character sets. A further 2 x 2K of RAM or EPROM can be added.

Expense Cutters Products, Inc.
Crash Guard
$19.95 plus $1.50 s&h; Visa/MC.

An attractive, professional solution to the problem of crashes from accidental RAM pack jiggle. Adds a good solid feel to your computer. Installation takes less than one minute.

Gladstone
RAM Packs
16K RAM (G16). $49.95.
64K RAM (G64). $149.95.
Coming: 32K RAM (G32). $99.95.

Reliable memory units that will not "crash" at critical moments. Made in USA, metal casing gives better shielding, quality edge connector, snug fit to back of computer with no "wobble," 6 month warranty. 32K RAM designed to stand alone or piggyback with the 16K unit to provide 48K.

Memotech's Memopak Range.
Memopak 64K (A64). $179.95.
Memopak 32K (A32). $109.95.
Memopak 16K (A16). $59.95.

Memic
CRAMIC-81 (C12). $179.95.

A 16K RAM pack using CMOS tech-

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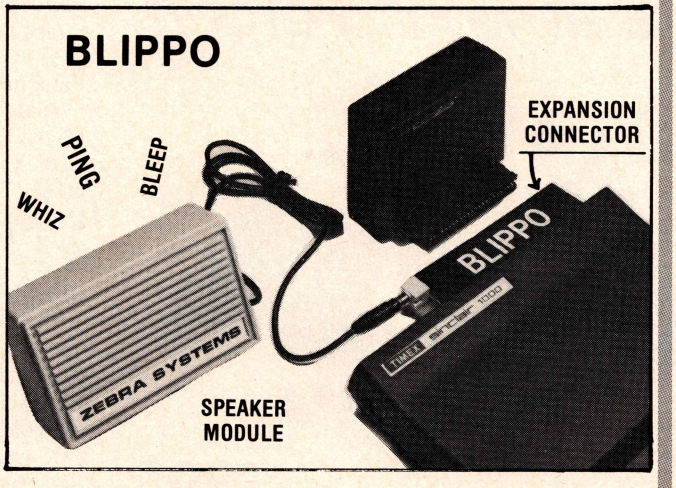

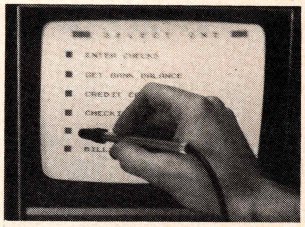

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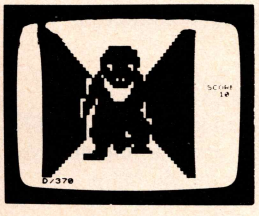

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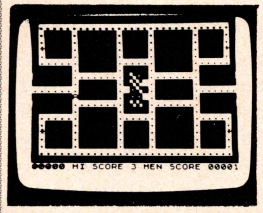

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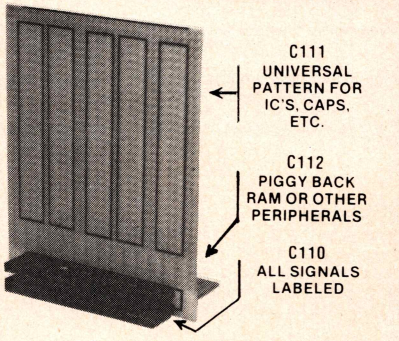

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nology to store data almost indefinitely. Loads almost instantly with virtually zero chance of error. Requires only a tiny amount of power supplied by a lithium battery (10 year life) to retain data in standby mode. Computer supplies power for active mode. Behaves like an ordinary RAM pack, but it can be powered down and removed. Ordinary RAM pack can be simultaneously connected.

Memic
Memic-81.
2K Version (C10). $59.95.
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Accessory with 2K or 4K CMOS memory. Allows user to write and store Basic or MC programs for a minimum of 5 years even with power disconnected. Programs load almost instantly. Especially useful for business or engineering applications. Resides in the 8-12K area of memory. Can be used with other RAM packs.

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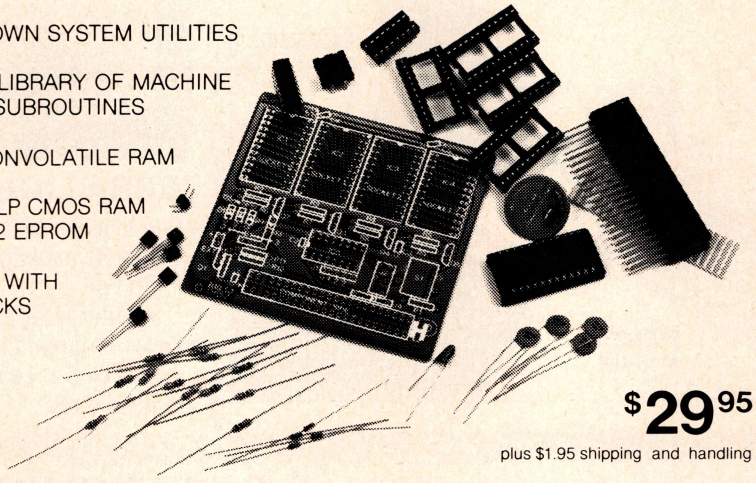
- USE HM6116LP CMOS RAM OR 2716/2732 EPROM
- COMPATIBLE WITH 16K RAM PACKS



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(SYNTAX QUARTERLY Winter 82)

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(OKLAHOMA S.U.G. Newsletter 1/3)

We found the documentation to be far superior to that (of) most hardware we've received.
(S.U.N. Newsletter Nov/Dec 82)

For versatility this is even better than an EPROM...ranks quite high on the list of "must-haves"...
(SYNC Magazine Mar/Apr 83)

INTRODUCTION

This memory board is designed to fill the transparent 8K block of memory (from 8 to 16K) in a ZX81-16K system. This area of memory is an ideal place to store, either permanently or temporarily, machine language routines or data which are to be used by the BASIC system.

A sample display routine, a program—merging routine, and procedures for storing utilities on tape are included with the kit.

The use of HM6116LP 2K CMOS RAM memory IC's with their own reserve power supply means that routines stored in the RAM are nonvolatile — the RAM retains its memory even when the ZX81 is switched off or reset. Moreover, being RAM, the routines you store in the memory are easily modified. The lithium cell supplied with the board will maintain sufficient reserve power for almost ten years.

ASSEMBLY

Complete step-by-step instructions in a 20 page manual make assembly of the board easy. Construction takes between two and three hours. The kit (pictured above) is complete with a silkscreened solder-masked printed circuit board, all capacitors, resistors, transistors, sockets, connectors, integrated circuits, and the lithium cell. The board is supplied with one 2K CMOS 6116LP-3 RAM — it will accomodate three more for a total of 8K.

Complete kit with 2K	$29.95
Additional three 6116LP-3	$16.00
Bare pc board & manual	$13.05
Assembled & tested with 2K	$44.95
Assembled & tested with 8K	$59.95
Shipping & handling per order	$ 1.95

Send check or money order to the address below.

HUNTER, 1630 FOREST HILLS DRIVE, OKEMOS, MI 48864

Memic
ROM-81 (C13). $34.95.

A 2K-8K ROM/EPROM Unit. Enables user to read useful routines and commonly used information, stored in U.V. erasable, programmable ROM. Supplied without EPROMs. Accepts either 2716 or 2732 EPROMs to allow up to 8K of memory in 2K increments. Separate 2K and 4K decoding is link selectable. Sockets decoded to lie within 8K and 16K in the TS1000. Additional circuits for slow EPROMs.

BASICare Micro System.

A series of stacking modules allowing the user to select the expansion he needs. Includes: Persona, Minimap, RAM 16, RAM 64, Drom, Toolkit, Pericon a, Pericon b, Pericon c. Listed by category in this issue.

Persona (B20). $59.95.

An interface module to enable Organic Micro to grow. Buffers in all the signals from the expansion port via a ribbon cable. Talks to other modules via 64-way Organic Bus configured to fit onto the given ZX81 Memory Address Map.

Minimap (B21). $59.95.

The key module for adding large amounts of memory although a few memory modules can be used without it. Extends the 64K of address space up to a possible 1Mbyte. Organized into vertical 64K pages. Up to 16 pages. Can be defined from within the program.

RAM 16 (B23). $49.95.

Add 16K RAM. On board address decoding permits simultaneous use of many RAM 16 modules in conjunction with Minimap.

RAM 64 (B24). $149.95.

64K RAM arranged as 4 blocks of 16K all of which can be used simultaneously under the control of the Minimap.

DROM (B25). $74.95.

Ultra low power memory backed by rechargeable battery for non-volatile storage of programs and data. Valuable for saving programs under development or often used routines or data. Makes cassette saving and loading unnecessary. Individual 2K blocks can be protected against accidental overwriting.

Pericon a (B27). $54.95.

A general purpose, user programmable device with 24 lines of I/O. Up to 4 can be used simultaneously allowing basic I/O, strobed I/O, and bidirectional 8 bit data transfer with handshakes.

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- ☐ How to Double Your Memory
- ☐ Least Squares Data Analysis With the ZX80/81
- ☐ Space Warp: A Graphics Space Game
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- ☐ Storing Three-Letter Words in an Array
- ☐ Software Review: ZX Galaxians
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- ☐ Understanding Floating Point Arithmetic
- ☐ Handling Strings from Another Dimension
- ☐ Book Review: Understanding Your ZX81 ROM
- ☐ How to Add a Keyboard to Your Sinclair
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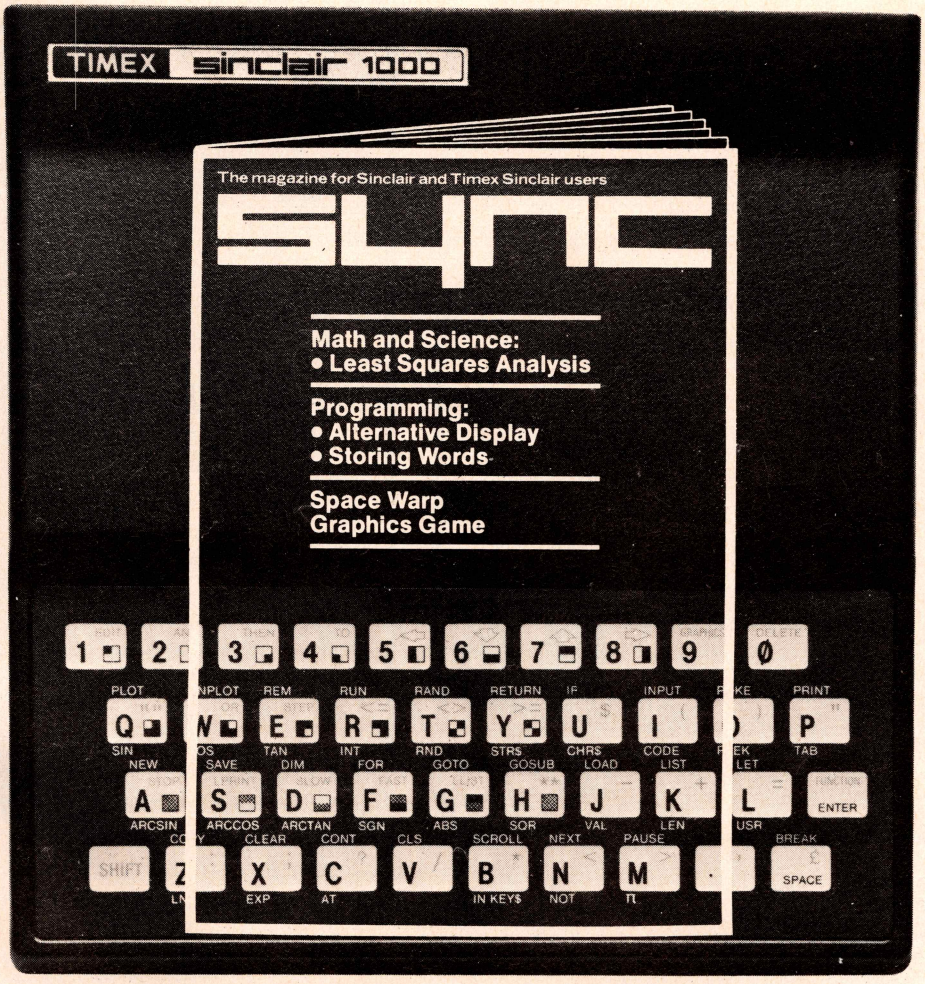

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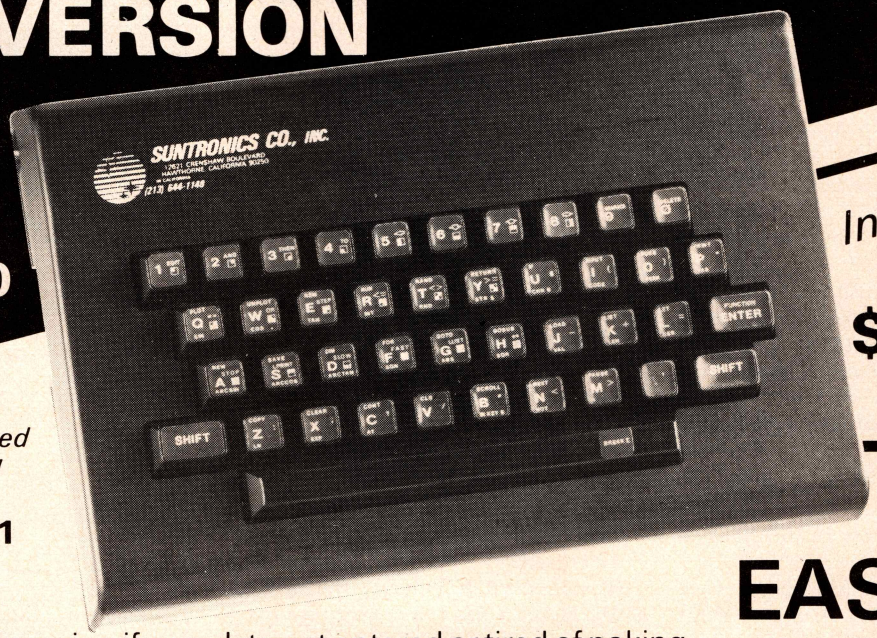
FOR YOUR ZX-81/ TS-1000



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KD-81 Features:

- **Full Size Keyboard with 41 Keys**
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- **Easy Assembly**
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- **Measures 10¾" x 7¼" x 2⅛"**

EASY TO INSTALL

- **No Soldering**
- **No Modifications**

Check out these simple installation steps!

1. Remove 4 screws securing ZX-81 case and remove 2 screws holding ZX-81 PCB.
2. Unplug the 2 ribbon cables from the ZX-81 keyboard.
3. Plug the 2 ribbon cables into the connectors on the KD-81 keyboard.
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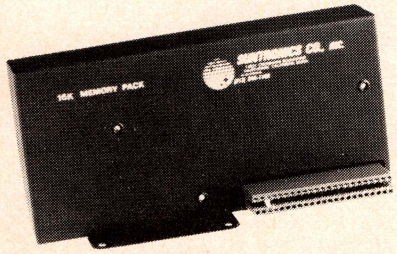
And enjoy the comfort and ease of inputting your data on a full size keyboard!

16K RAM Module

with "PIGGYBACK" Connector for those EXTRA ADD-ONS



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- Equivalent to ZX-81 or TS-1000 16K RAM in performance

MX-16 mounted on the ZX-81

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MD I/O Expansion Board (M70). $89.95.

Board mates to ZX81 edge connector via a custom made cable. For inexperienced users the A/D-D/A Expansion Board is recommended. Sophisticated users will be able to connect their own devices to the MD I/O Board which provides a bus, similar in function to an S-100 bus and which buffers and decodes address lines, inhibits the internal RAM (and external RAM) when I/O is selected, accepts optional 16K RAM on a Sinclair type edge connector.

MD A/D-D/A Expansion Board (M71). $89.95.

Provides 2 channels of ADC and 2 channels of DAC. 8-bit resolution is obtained in 100 microseconds. I/O command requires a single line of PEEK or POKE. Sample programs.

Hunter
8K Nonvolatile CMOS RAM/EPROM Board
$29.95 plus $1.95 s&h.

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Memotech Corporation
Memopak 16K Baseline. $49.95.

The 16K Baseline is the most economical way to add memory to your TS1000. It is fully compatible with Memopak 16K and 32K RAMs to provide you with up to 32K or 48K RAM respectively.

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The EPROM-READ card accepts 2K 2716 and 2516 EPROMS. No RAM is used. Operates in the ROM space 8192-10239 of the memory map. The EPROM-READ card fits between the computer (or printer) and the 16K RAM pack. With modification it is compatible with certain other types of RAM. (Greater than 16K). A pre-programmed EPROM is available.

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RAMstrap. $3.00 pp.

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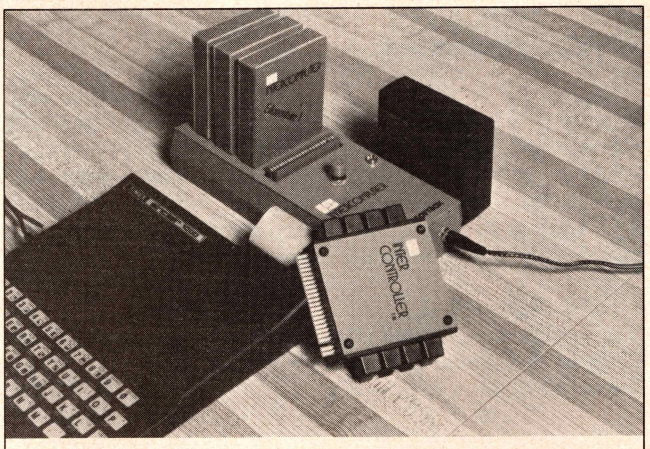

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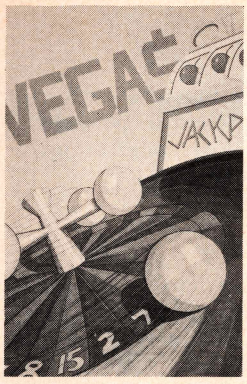

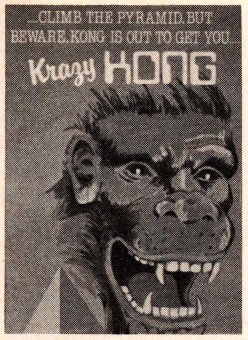

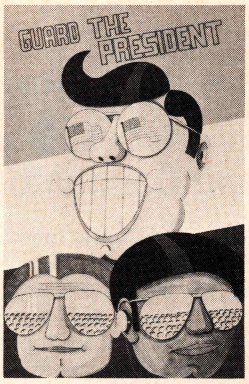

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All programs use 16K RAM.

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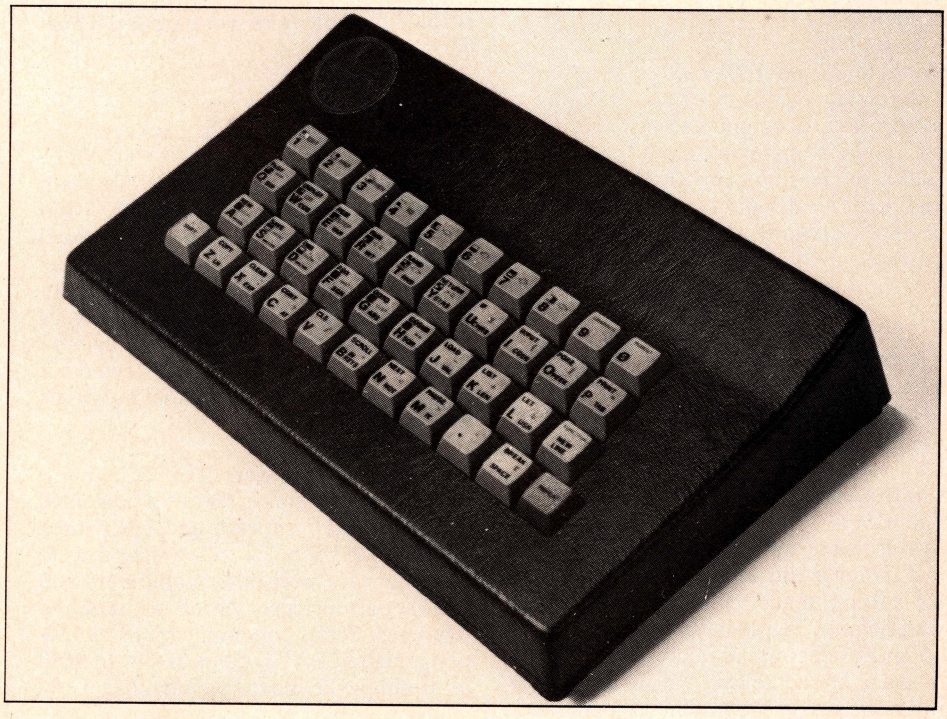

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Serial Printer Firmware. $24.95.

The serial printer firmware is contained in the ASCII Firmware and when used with the CAI/0 board, allows the user to communicate with other computers and with serial devices such as printers and teletypes. Serial communications can be performed at BAUD rates of 110 to 9600 using simple keyboard commands.

CAI/0 Board. $79.95.

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ASCII Communications Firmware. $24.95.

The CAI/ASCII firmware is used with the CAI/0 board. Converts the non-standard Sinclair code to standard ASCII code allowing the TS1000 and ZX81 computers to communicate with other micro/mini computers (Apple, Commodore, TRS-80, IBM, etc.) and main frames with computer networking systems.

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Analog Interface Board.
Assembled and tested: $230.
Kit: $180.

A/D 8 channels plus D/A 8 channels high speed 8 bit all purpose interface board. Works on any Sinclair computer and includes features for easy interfacing to other brands. Many mounting options: Box and ribbon cable: $15; Piggy back kit: $15. Software for digital scope and spectrum analysis.

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Kit: $65.
Bare Board,connector, manual: $40.

Fully buffered with four types of connectors to connect to prototyping cards or peripherals. Circuit frees 8K of addresses for your use. Provision for voltage regulator. Fits ZX80/81, MicroAce, T/S1000; no ROM or RAM requirements.

Ribbon Cable Connector

Female ribbon connectors fit on to Sinclair computer: $7. Male ribbon connector fits onto peripherals: $7.

UHF Modulator. $15.+ s&h.

Replaces the VHF (ch 2-3) modulator on the ZX81 circuit board. UHF receiver is much less sensitive to the interference which is radiated from the computer or its peripheals. Makes using your TV possible with unshielded peripherals.

Computer Engineering Services
ZX80 Video Upgrade Kit
$12.95 plus $1.20 s&h.

Get FAST and SLOW modes on your ZX80 with 8K ROM. PCB with complete instructions and parts list. PCB. will work with new ROMs if installed properly.

Cosmonics
Cosmonics Plans for an RS232C TTL Level Converter. $6.50 plus $1 s&h.

These plans allow you to construct an RS232 TTL Level Converter from simple, inexpensive hardware components. The plans are written in a step-by-step manner, and include diagrams. This converter, when used with the Cosmonics TTL Serial Input/Output Port Package, will allow you to connect a TS1000 or ZX81 to most RS232C peripherals.

Cosmonics TTL Serial Port Software
4K RAM. Cassette: $18 plus $1.50 s&h.

Provides the proper timing for RS232C; translation between the ASCII character set and the Sinclair character set. Allows the user to connect his computer to a modem, printer, or terminal via use of TTL input/output port plans and an RS232C TTL level converter. Plans for ports and converter are available from Cosmonics.

Cosmonics TTL Serial Input/Output Port Package
4K RAM. $26 plus $1.50 s&h.

This package contains Cosmonics TTL Serial Port Software, plans for building input and output ports which reside inside a ZX81 or TS1000, and necessary hardware components. When this package is used with an RS232 TTL Level Converter, the user may connect his computer to most RS232C peripherals.

Continued on page 116.

CHANGE YOUR
TIMEX/SINCLAIR 1000 DISPLAY
TO FULL COLOUR GRAPHICS
with

KOLORWORKS

LOOK AT THE FEATURES !!!

- Plugs into ZX81/1000 (edge connector)
- Latest technology with TMS9918 VDP (32 sprite levels)
- Module contains it's own memory
- All text will run on the color tv
- User defined characters & graphics up to 256x192 pixels
- Module contains extension of basic commands including: PAPER/INK/ BORDER/BIN/SPRITE/OUT/INP/etc.

for $149.95

KOLORWORKS COMES WITH A LIMITED WARRANTY ON PARTS AND WORKMANSHIP

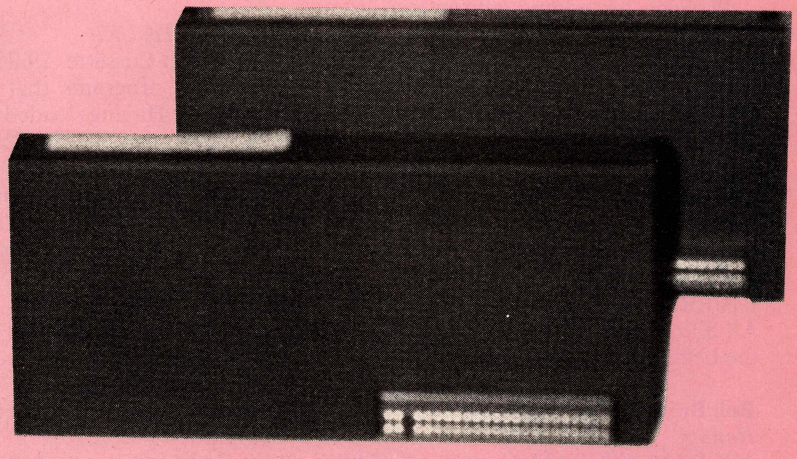
USE YOUR KOLORWORKS IMMEDIATELY WITH A GAME CASSETTE FOR $9.95

This delightful game is designed for hours of fun using some of the color graphic capabilities of KOLORWORKS. The cassette also contains a short program to familiarize you with some of the commands and graphics.

Enjoy Game Fun With

GAAMWORKS

THE SOON TO BE RELEASED GAME MODULE (proto-type stage) WILL OFFER SOUND, ROM CARTRIDGES AND JOY STICK PORTS FOR YOUR TS1000/ZX81.



- **THE SOUND** will be of arcade game quality which you can program for music, animals, transportation (auto, train, airplane, etc.) and machine sounds.
- **ROM CARTRIDGES** will have up to 8K of ROM using either 2716, 2732 or 2764 EPROMS. We will have pre-programed cartridges and blank cartridges which you can program. We will be offering a service to burn EPROMS from your cassettes.
- **JOY STICK PORTS** will allow for the use of two "Atari"®compatible joy sticks.

SORRY PRICE IS NOT AVAILABLE AT THIS TIME! GAAMWORKS WILL BE AVAILABLE BY MAIL ORDER STARTING MARCH 1st. FOR FURTHER INFORMATION, SEND $2.00 (Credited to Order).

At this time KOLORWORKS and GAAMWORKS is available only by mail order.

MAIL TO: **BRAINCHILD COMPUTER WORKS, INC.**
P.O. Box 506
Pewaukee, WI 53072

	PRICE	QTY.	AMOUNT
KOLORWORKS	$149.95		
CASSETTE	9.95		
Shipping & Handling	4.95		4.95
Wi. residents add sales tax	TAX		
	TOTAL		
My ☐check ☐ money order is enclosed	ENCLOSED		

Name

Street

City **State** **Zip**

Please allow six to eight weeks for processing. Thank you.

Programming Your Computer

Programming Aids, Utilities, Toolkits

ACS Software
ACS-Debug
16K RAM. £5.50 plus s&h.

Machine code debug program. Provides register contents, memory search, block move, memory list, etc. Can be wed with *Acsemmbler* and *Dis-Acsem*. Marketed in the US by Cleva Computer Ware.

ProgMerge
16K RAM. £5.50 plus s&h.

Package for the merging and renumbering of Basic programs. Renumbering routine can be used on its own if required. Marketed in the US by Cleva Computer Ware.

ProgStore Toolkit
16K RAM. £5.50 plus s&h.

Package for adding subroutines from tape to a main program. Comes with subroutines for hexloader, hexlister, progstore expansion, renumber. Marketed in the US by Cleva Computer Ware.

Barlog Software
Machine Code Starter
16K RAM. Cassette: $7.

A machine language program containing 3 sub-routines: MEMORY LEFT, INVERSE SCREEN, and FILL SCREEN. All 3 are disassembled and explained to the beginner.

Bob Brown
Renum
16K RAM; 64K RAM. Cassette: $5. SASE for information.

Self-loading line renumberer that does GOTOs and GOSUBs; renumbers a Basic program in 5 seconds. All machine code.

Bug-Byte Software
ZXTK
16K RAM. Cassette: $14.

Toolkit adding 10 commands including: FULL RENUMBERING, MERGE PROGRAMS, READ FILE NAMES FROM TAPE, and more.

Cleva Computer Ware
De-Bugger
16K RAM. Cassette: $9.95.

Makes writing machine code programs easier. Works entirely in decimal; hexadecimal is not needed.

Progmerge
16K RAM. Cassette: $9.95.

A series of machine code routines for storing Basic programs. The stored material can then be inserted into a second Basic program and the composite program formed is automatically remembered. Progmerge runs immediately after loading and by the time that the summary of the instructions appears on the screen, the machine code instructions will have been transferred into user space.

Progstore
16K RAM. Cassette: $9.95.

A series of machine code routines that create 3072 bytes of user space and then transfer into this space machine code routines that allow the transfer of a Basic program into the user space after running this program allow a return to another Basic program stored conventionally in low memory.

Progstore/Tool Kit
16K RAM. Cassette: $9.95.

4 utility programs that operate from progstore. Having loaded progstore in tool kit can be loaded and then progstored with RAND USR 32500. Each program can be run by RAND USR 32723. Hexloader allows machine code programs to be rapidly written in hexadecimal. HEXLISTER: complements HEXLOADER by allowing machine code programs to be listed in hexadecimal.

Computer Engineering Services
Compute
16K RAM. Cassette: $12.95 plus $1.95 s&h.

A programmable program. If you are a serious programmer of the Sinclair, this program will help you to assign various mathematical functions to your program variables. Instructions and listing. By Rolf L. Miller.

Cosmonics
CIOUTIL
2K RAM. Cassette: $17 plus $1.50 s&h.

This utility allows the user to save data from strings, arrays, or a memory location onto a cassette. It can assist in the translation of program listings written in Basic which contain "write to cassette" and "read from cassette" statements. Full documentation and a sample program demonstating its use.

CFASTDATA
16K RAM. Cassette: $20 plus $1.50 s&h.

This utility provides all of the capabilities of *CIOUTIL*, but is 6 times faster. Writes data to cassettes and reads data from cassettes at a speed which is 6 times faster than the TS1000 and ZX81 SAVE and LOAD commands.

CFASTDUET
16K RAM. Cassette; $27.50 plus $1.50 s&h.

2 programs: CFASTDATA and CFASTLOAD. When both programs are used, you may LOAD programs and data at a speed which is 6 times faster than the TS1000 and ZX81 LOAD and SAVE commands. CFASTLOAD can be configured to your needs. No additional hardware is needed.

CRC Software
Reline
16K RAM. Cassette: $9.95.

Renumbers your Basic programs. This is a very useful utility.

Custom Electronics Device Corp.
ML Nit-Pick

Look at blocks of memory; load hex code from the keyboard; see the results of your program run register by register, flag by flag. Converts hex to decimal and vice versa. Write for details.

Gladstone

BASICare Micro System.
Toolkit (B26). $44.95.

Accepts up to 8K of utility programs in EPROM/ROM. Located in address space after ZX81 on board ROM, allows for calling of Toolkit held routines via the USR function.

Toolkit (Z42)
16K RAM. Cassette: $14.95.

Features: RENUMBER, DELETE, MEMORY check, DUMP (displays current values of string and numerical values, except arrays), FIND a string, REPLACE a string, SAVE (transfers program to below RAMTOP), APPEND (joins 2 programs), REMKILL (removes all REM statements). (From Artic Computing.)

Z-Aid (Z98)
16K RAM. Cassette: $14.95.

VERIFY confirms whether a program has been recorded properly. Mload/Msave enables specified block of memory to be saved. VPTR eliminates tedious

PEEKs and POKEs to find where variables are stored. CHAIN allows 2nd part of a Basic program to be added to the end of the first. Z-Aid resides at top of 16K.

4K Toolkit (D14). $29.95.

Editor for Basic programmers. Offers 11 facilities: ALTER (replace a string); BYTES (how much free memory); COPY (duplicates program lines); DELETE (a block); FIND (a string); HELP; INSERT (merge two programs); KEEP (a block of lines by storing them above RAMTOP); MOVE (lines within a program); RENUMBER; VERIFY.

ZX Forth (Z43). $29.95.

Forth allows you to define your own language by adding new functions to the language to match it to whatever you want to do. Advantages of Forth: Speed (runs up to 10 times faster than Basic); Interactive (once a word is entered it is compiled immediately and available for use); Flexibility; Structured. Package includes: ZXForth on cassette, user's manual, editor on cassette written in Forth, and editor manual.

Graphicomp
Machine Code Test Tool
16K RAM. Cassette: $25.95.

A utility program with a tutorial course enabling you to enter, test, display, and debug hexadecimal machine code routines. By Oxford Computer Publishing. Available only in Canada.

Human Engineered Software
2K Programmer Kit
2K RAM. $12.95.

A first for Timex owners without expansion memory. Provides beginning programmers with the same time saving utilities previously available only with expanded memory.

Integrated Data Systems
2 Programming aids from Kayde
16K RAM. Cassette: $11.76 each.
Promerge. Toolkit.
Programming aids from Oasis Software. $14.80 each.
Macro Assembler. Disassembler and Debugger.

Kopak Creations, Inc.
Toolbox
1K RAM. Cassette: $19.95.

This program has the ability to read the names of programs on a tape and create a directory. You can also read data to the tape, and save data.

Management Services Co.
SYSLD
16K RAM. Cassette: $12.95 pp.

Take the burden out of writing in machine code with this utility: totally menu driven selector; write, list, insert, delete, and move machine code anywhere in memory; hexadecimal to decimal converter; routines in machine code for fast response; comprehensive documentation.

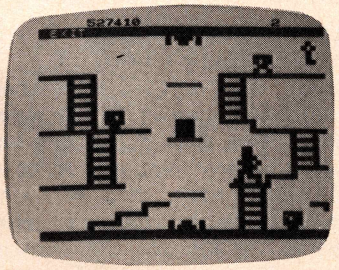
Melbourne House Software, Inc.
ZX-Toolbox (26406MY)
1K RAM. Cassette: $14.95.

3 Programs. Directory: Displays names of programs on a tape. Record: Allows SAVEing data and READing it back into the program later; can be incorporated into your own Basic programs. Toolkit: Allows you to get better graphic effects and to write your programs more quickly and efficiently; commands: NO INVERSE, INVERSE, REVERSE, FILL, FREE, RENUMBER, FIND & REPLACE, OPEN. By Dr. Ian Logan and David Webb.

Microsystems Specialists, Inc.
uSS Pilot
16K RAM. $29.95 plus $2 s&h.

The latest language for the Sinclair and Timex systems. An excellent introductory language for children and beginners since it is easier to use than Basic. Features one-character commands and a line editor. Includes tutorial and sample programs.

VIDEO ARCADE
PETE'S FACTORY



Pete's Crating Factory has just been invaded by an evil genius "Dr. Drake". He has added departments to carry out his work with robots and totally redesigned the factory. This would foil any attempts to plan a takeover by studying the factory's original blueprints. After five attempts to sieze the factory are abandoned, Pete decides to hire you to get the factory back. Pete tells you the only two clues he knows; to get from one level to another you must acquire a key and open the exit door, also there are robot demobilizers on each level that destroy only one robot. Pete's factory is in your hands.

Video Arcade is planning many different arcade type game sin the future for the Timex/Sinclair Computers. Universal joystick ports and ROM cartridges are also coming soon. If you have any comments or suggestions please drop us a line. LTurn your Timex/Sinclair computer into an arcade with Video Arcade. Send $12.95 check or money order for Pete's Factory

To:
Video Arcade
824 Val Vista Avenue
Sheridan, WY 82801

Mindware Inc.
From Eagle Sales
Screen Kit
16K RAM. Cassette: $19.95 plus s&h.

Series of MC routines for use in Basic programs. Execute complicated operations with a few commands: Draw any size border; clear part or all of the screen; slide screen up, down, right, or left; invert video on part or all of the screen; create a flashing cursor; find how much memory is left; load any character to the whole screen; save and load Basic variables only to create data files. By Picturesque.

From Eagle Sales
Toolkit
16K RAM. Cassette: $19.95 plus s&h.

Lets you execute many familiar routines with a single command. Comprehensive LINE RENUMBER including GOSUBs and GOTOs, LOAD, EDIT, and RUN machine code programs; INSPECT the ZX81 and TS1000 system routines; COPY these routines into RAM and PATCH or EXTEND them; FIND a given piece of Basic code and replace all occurrences of it; move blocks of Basic lines with EDIT. Examples and instructions. By Hewson Consultants.

P. Nethercot & R. Rackstraw
ZX81 CESIL Compiler
16K RAM. Tape only. 3.

Run CESIL on your ZX81. Up to 40 CESIL lines per program. Facility for modify, list, printout listing, etc. Menu driven. Available soon. See note in Suppliers Directory.

Oxford Computer Publishing Ltd.
Machine Code Test Tool for Spectrum and TS2000.
16K or 48K RAM. Cassette: $19.95.

The ultimate tutor and debug program. Lists and displays Machine Code instructions as they are written. Ideal for both the novice and the expert. With full 32 page tutorial. Hex-decimal conversion as standard. Superb "user" design graphics feature.

Peak
String
2K RAM. Listing: $2.

A routine you can add to your programs to search for commands, words, phrases, names and phone numbers. String can help in any program where you need to recall words for correction or information.

Renumber
2K RAM. Listing: $1.

A line renumbering routine for your programs. Allows you to insert quickly new lines and program statements.

Pleasantrees Programming
Basecon
16K RAM. Cassette: $9.95 plus $1.50 s&h.

Base conversion tool for machine language programmers; converts numbers between binary, octal, and hex; accepts any base up to base 16 and returns its base 10 equivalent or vice versa; whole or fractional numbers; detailed instructions.

Graphics: A to Z
$17.95 pp.

Manual just on programming graphics. Topics include: animation, 3-D plotting, diagonal scrolling, writing and dissecting uneditable programs, MC shortcuts, and more. Packed with listings. Invaluable Memotech HRG chapters, including: comprehensive subroutine explanations, MC control, and complete firmware disassembly, Available 5/83.

Programming Form Pads.
$2.19 each plus $.75 per pad s&h.

50 sheets, 8 1/2 x 11; printed with all lines including edit lines on premium eraseable paper. Specially printed Windowcard comes with each pad making line reading simple.

G. Russell Electronics
Key
16K RAM. Cassette: $10 pp.

Short program of four powerful machine language routines unlocks computer power to let you: 1) SAVE and LIST any ZX81/TS1000 cassette program—even those normally unLISTable, unSAVEable cassettes. 2) LOAD two programs, one after another and 3) MERGE them into one program. 4) Display number of bytes remaining in RAM for programming at any time, instantly.

Sinware
Z Extra
16K RAM or more. Cassette: $19.95 plus $2 s&h.

A display manager and data filing program in machine code. Provides a full screen editor for a direct keyboard-to-screen link with full editing and plotting features. Filing and display facilities permit page-flip animation or horizontal or vertical scrolling through windows. Stores up to 99 screens in 64K.

Step
16K RAM. Cassette: $14.95 plus $2 s&h.

A debugging tool for Basic programmers. Provides single stepping through program lines or conditional or loop breakpoints. Basic display and reports on up to 15 expressions available after each step. Written in machine code to fit in upper 3K of your 16K RAM.

Z-Tools
16K RAM or more. Cassette: $14.95 plus $2 s&h.

A machine language extension to the Basic editor that allows you to merge two Basic programs, to renumber, copy or delete blocks of lines, and to verify a program on tape against memory. Available for the upper 2K of a 16K RAM pack or for the 8-10K block of an expanded memory.

Softest
ZX81 Test
1K; up to 16K RAM. Cassette: $10.

Suite of test programs. Tests, displays, memory, keyboard and primary basic functions.

Softsync, Inc.
Machine Code Test Tool
16K RAM. Cassette: $19.95.

This package contains a utility program and a complete tutorial course book which enables you to enter, test, display, and debug hexadecimal machine code routines simply and quickly. This tool is constructed to help the beginner who wishes to explore machine code programming as well as the expert who wants to polish up.

Programmers Toolkit
16K RAM. Cassette: $14.95.

Toolkit provides machine code routines to help you write better, faster, and more elaborate programs. Renumber program lines, SEARCH and REPLACE any character, insert a WAIT condition to stop the program until a signal is input, HYPER GRAPHICS MODE, and more. "Compatible" with the *Graphics Kit* and can be loaded with it, making a powerful programmer's aid. (Licensed from Paul Holmes.)

Soft Way
Utilities Tape 3
16K RAM. Cassette: $10.95.

Menu driven. Manipulates assembly language programs in decimal or hexadecimal code. Stores assembly programs in protected memory safe from the NEW, LOAD, SAVE and CLEAR. *UT* is a short version of *Utilities* for fast transfers and displays. Add assembly programs and continually increase the capabilities of *UT*.

Spectra Computer Problems
Instructional Packette series

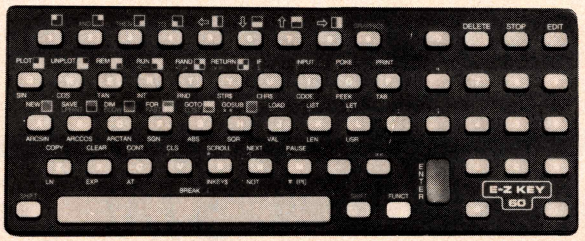
Packettes are developed to help troubleshoot and improve the computer. They deal with specific subsystems and supply an exhaustive treatise covering all possible malfunctions, their solutions, and, in most cases, plans for constructing components to improve that system. Packettes endeavor to supply information

Join the CLICK!

Enter your programs Faster & Easier with the E-Z Keyboard . . .

At last, a large 60 key "Tactile Feel" keyboard that plugs into the same connectors as the existing keyboard on your ZX81 or your Timex-Sinclair 1000.

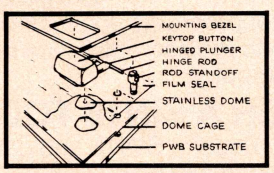
Hear the CLICK and feel a SNAP for every key pressed! (Tactile Feedback).



E-Z Key 60 has the following features:

- 60 Keys - Legends in 3 colors on the base
- Molded legends on key tops
- 8 Automatic shift keys (no shifting required) for edit, delite, single and double quotes,colon, semi-colon, function and stop.
- 2 Shift keys - **Numeric key pad** - 5" space bar.

E-Z Key 60 requires no wiring (just plug it in) and can be adapted to fit the XZ80 or the MicroAce (8 KROM). The Mounting base measures 10"x4". Cables and instructions are included.



SWITCH SPECIFICATIONS:
Key tops measure .4" x .3" - spaced at ¾" intervals between keys. Life = 10 million operations, typical. Force = 3. oz. Travel = .040". Dome switch, button type with arm to give .040" travel.

Only

$84.95

A custom made enclosure (shown above) is also available for your computer and E-Z Key 60 keyboard.

Measurements:	Price:
EC-11 11"x9"x3"	$25.00
EC-14 14"x9"x3"	$30.00

WATCH FOR THESE NEW PRODUCTS!

JOYSTICK: Joystick kit that requires no wiring and will fuction like the arrow keys & Ø on your computer.

E-Z Key 40 Replacement flat keyboard with embosing around each switch and 3 color legends and graphics as existing keyboard (plug in replacement).

Delivery 4-6 weeks. 90 day warranty.

USE THIS ORDER FORM...

☐ Check or Money Order

Charge to my:
☐ Visa ☐ Mastercard

Card # _____

Expires _____

	Quantity	Unit Price	Total
E-Z Key 60		$84.95	
EC-11/14		$25/$30	
Total units S&H $4 per unit			
Mass, res. add 5% sales tax			
		Total	

Send to:
E-Z KEY
Suite 75 A
711 Southern Artery
Quincy, MA 02169

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

E-Z KEY

SUITE 75 A, 711 SOUTHERN ARTERY
QUINCY, MASSACHUSETTS 02169
(617) 773-1187

Programming, continued...

on all the Sinclair computer series. Included are:

Complete Video. $7. Covers video trouble shooting tips, UHF conversion, fine tuner for the RF modulator, direct and reverse video.

Complete Keyboard. $7. Covers decoding a standard ASCII keyboard, decoding shift keys, reset, and repeat keys, and keyboard beeper.

Complete LOAD and SAVE. $7. Covers troubleshooting tips and plans for LOAD monitor and signal filtering.

Complete Memory. Coming soon. Memory pack trouble shooting and plans for constructing your own memory pack, EPROM reader and extending the memory of the 16K RAM pack up to 64K.

SyncMaster
Screen Machine
16K RAM. Cassette: $14.95 + $1 s&h.

Program inputs like on mainframe computers. 1K ML sub-routine allows inputs anywhere on screen, complete error checking, automatic formatting (dates, decimals), and advance directly to next prompt. Easy interface to programs; one string and a gosub. Saves valuable programming time and looks more professional.

Machine Language Helper
16K RAM. Cassette: $14.95 + $1 s&h.

Easily enter ML listings, programs. Convert hex to decimal. Examine ROMs. Manipulate memory any way you can think of; move blocks, bytes; insert, delete ranges of memory. Bring out the full power of ZX/TS machines.

Syncware Company
Multiprogram Demo
16K RAM. Cassette: $10.

A tutorial on a technique for storing multiple programs in 16K or more RAM at the same time. No MC knowledge assumed. Cassette illustrates the technique with four games programs: all programs listable. Games are condensed versions of "Syncwars," "Minotaur," and "Blackjack."

Timeworks
Beginning Game Design (1401).
16K RAM. Cassette: $16.95.

Game design of "Lunar Lander," a challenging space game. Kit shows in detail what should go into a good game program; covers display, design, and animation. Based on our 8 step procedure of a "Top Down" design approach: General concept, Displays, Flow Chart, Algorithms, Writing the Program, Type in the Program, Debug the Program, Modify the Program.

Intermediate Game Design (1402)
16K RAM. Cassette: $16.95.

Game design of "Slot Machine," a game of skill and chance. Kit shows in detail how to design a more sophisticated game. This is not, however, a typical slot machine program. A few surprises are thrown in. Uses the "Top Down" design approach; covers use of arrays, FOR-NEXT loops, subroutines, and how to make RND work for you.

Intermediate Data Handling (1403)
16K RAM. Cassette: $16.95.

The design of a fundamental Data Base that can be used for anything from a mailing list to a date reminder. Uses the "Top Down" design approach; covers information entry and retrieval, tape storage, string arrays, and sorting techniques.

Troiano Software Company
Starter Software Packages
2K RAM. Listing: $4.

14 programs to introduce both the Sinclair and the language Basic. The programs cover several different topics including education, games, and graphics. As your programming skills increase, these programs will produce a solid format for your own software.

SOFTWARE

ZX81 - TIMEX-SINCLAIR 1000

DR. FLOYD™

Psychoanalysis by computer? - well not quite but Dr. Floyd will carry on a conversation with you using psychoanalytic techniques giving the appearance of artificial intelligence. Requires 16K RAM. $10.00

GRAPHICS PAC I

An introduction to Sinclair graphics - includes: 2 random picture drawers, allow creation of "Pop" art. A screen formatter which allows placing any character anywhere on the screen. Complex pictures may be created & saved. Doodler allows line art drawings to be created & saved. Requires 16K. $10.00

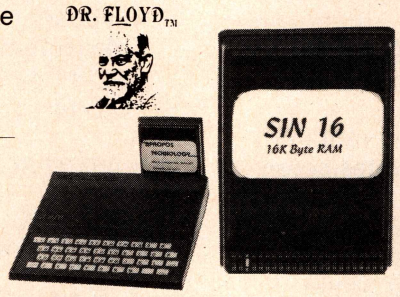
WORD PLAY™

Includes "Jargon" - a jargon word generator. "Animal" - a fun game where the player teaches the computer all about animals. "Story" - the computer writes stories using the players input names, places, etc. Can be very funny for kids, "Haiku" - the computer composes HAIKU like poetry. Requires 16K. $10.00

SPECIAL! Order all 3 programs for only $25.00!!

This is a TRUE BARGAIN! DON'T MISS IT!

All software is on high quality cassettes and is replacement guaranteed.



HAIKU

These are the BEST BUYS in this magazine

ORDER TODAY!!

Send check or Money Order
All shipping included
Calif. residents add 6% tax.
Phone orders: CALL

805/482-3604 24 hrs.

For credit card orders, include all information on card.

DEALER INQUIRIES WELCOME

SIN 16

16K Byte RAM

$35.00 Shipping included

This attractive memory expansion allows you to run virtually all the programs written for the ZX-81 or Times-Sinclair 1000. SIN16 is fully compatible with other plug-ins and is superior to other RAMs because it uses 30% less power. This extends the product life to many years. We use the best gold- plated connector on the market, so SIN16 will not cause loss of programs due to poor connection to the computer. Get real power for your computer.

ORDER A SIN16 TODAY!

SPECIAL! - Order a SIN16 and get any one of the 3 programs **FREE!**
Just list the one you want.

10 day return privilege on all hardware -

6 month parts and labor warranty.
Extended service always available -

WE SERVICE WHAT WE SELL.

APROPOS TECHNOLOGY 350 N. Lantana Ave., Suite 821 • Camarillo, CA 93010

PRG-DLR
2K RAM. Listing: $3.

Cassette program directory allows the user to catalog programs that were stored on tape. Program name can be added/changed/deleted.

Tree Systems
Multi-Forth
2K RAM. SASE for information.

This is a multi-tasking Forth with most of the standard fig-Forth words. The language is perfect for control applications: DC servos, A/D converters, furnace controller, read temperatures, etc. EPROM on circuit board. Switch between Basic and Forth.

T-S Systems
Multiple Screens
16/48K TS2000. Listing: $4 plus large SASE.

Utility type program which gives the power to store 3 different screens and remembers any of them in microseconds.

2-Bit Software
Turning the Truth Tables
2K RAM. Cassette: $9.95.

First in a series on the principles of programming. No lectures or lessons. Have some fun as you find out what "and," "either," "or," "if," and "then" mean to a computer. Some things may not be so logically impossible as you might think. Or so possibly illogical. Ages 12 and up.

UAS
Data Base Conversion. (C8003).
16K RAM. Cassette: $3.95.; listing: $1.00

Input your number in any of the following data bases: decimal, binary, octal, hexadecimal. Get the equivalent in the other data bases.

Basic Instruction. (L3017).
16K RAM. Cassette: $3.95.

Detailed program listing for *Integer* program C3017 (see games) to illustrate various advanced programming techniques. Improve your programming skills while writing a new game program to capture your imagination.

Decision Tables. (C8000).
16K RAM. Cassette: $5.95.; listing: $1.00

Eliminates redundancy in your programs. The instructions for this program include a section on the way to convert from flow diagrams to decision tables and back. The program will help you to trim a 15 by 15 table resulting in considerable memory savings.

The Ultimate Blackwood
16K RAM. Cassette: $12.

LODAB merges basic programs, renumbers lines, and tells the user the size of each program. A demonstration program is included, as is a very complete user's manual.

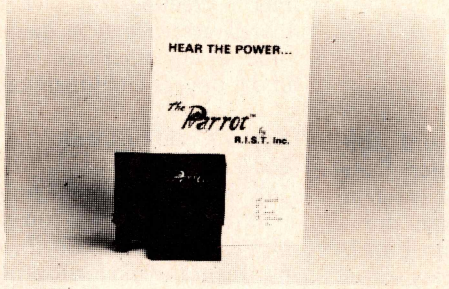
Assemblers, Disassemblers, Compilers, Monitors

ACS Software
Ultraviolet
Spectrum 16K/48K RAM. £7.50 plus s&h.

Z80 assembler. All Z80 instructions correctly assembled. Supports EQU, ORG, DEFB, DEFW, DEFS, etc. Code can be assembled and then relocated.

Continued on page 118.

HEAR THE POWER OF YOUR TIMEX/SINCLAIR™



Features:
- Programmable speech/and sound effects.
- Amplifier and Volume Control.
- "Piggy Back" expandability.
- Speaker output jack.
- Power input jack for expanded system operation.
- Professionally written software examples included on cassette tape.
- Complete detailed instructions are provided being both educational and informative.
- Compact, reliable and safe.
- All for $89.95

The Parrot™ by
R.I.S.T. Inc.

It's been said that the future belongs to those who understand computers. If that's true, what better way to do this than by having them talk to you.

Now you can. Quickly. Simply. Economically.

Let the power of your Sinclair ZX80/81™ or Timex Sinclair 1000™ speak for you now. Through R.I.S.T. Computer Components, Inc. The Parrot™ - your ZX80/81 or TS1000 can speak...clearly, consisely and without limit.

R.I.S.T. has developed a state of the art voice synthesis module *you plug in.* The Parrot™ utilizes allophone concatenation to synthesize speech, with limitless vocabulary. Sentences, and any English language word can be created.

Best of all, The Parrot™ is affordable. For $89.95, your ZX80/81 or TS1000 can give you the voice of the future...*today!*

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P.O. Box 499, Ft. Hamilton Station, Brooklyn, NY 112090499
My computer is ☐ ZX80 ☐ ZX81 ☐ TS 1000
Enclosed is $_____for_____module(s) at $89.95 ea., plus $4.00 Shpg. ea. (includes complete documentation).
N.Y. State Residents Add 8¼% Tax ($7.40)
☐ 9V Power Supply (optional) $9.95 ea. (Required for ZX80 or expanded system operation).
Available in Canada thru Integrated Data Systems
11 Brighton Avenue, Toronto, Canada M4M 1P3
For orders outside continental U.S. & Canada please send bank draft.
NAME _____
ADDRESS _____ *APT.*_____
CITY _____ *STATE*_____ *ZIP*_____

Using Your Computer: Programs

Graphics Programs and Aids

ACS Software
Viewpoint
Spectrum 16K/48K RAM. £6.50 plus s&h.

3-D graphics package. Routines for rotating wireframe images in three dimensions. Written in Basic for the user to modify to his own requirements.

American Micro Products, Inc.
Sketch-A-Screen
16K RAM. Cassette: $17.95.

Two programs: 1) a computerized sketchpad with eight directional controls for using the plotting cursor; 2) a scrambled letter puzzle in which the user must arrange the letters in a given order using four direction controls.

Apropos Technology
Graphics Pac 1
16K RAM. Cassette: $10 pp.

An introduction to Sinclair graphics includes: 2 random "pop" art picture drawers; 2 doodlers which allows line art drawings on the screen. A screen formatter allows drawing with any of the computer's character set. All creations may be saved on cassette.

Calliope Software
Metagraphics
16K RAM. Cassette: $12.95.

Create elaborate drawings with over 2000 different graphics characters and backgrounds. Simple enough for children, yet will delight any adult. Machine code and Basic.

Data-Assette
Kayde High Resolution Graphics. $59.95,

Graphics Board fits inside the TS1000 or ZX81. Complete with a pre-programmed 4K Graphics ROM. Will give an extra 450 graphics and with the inverse there are over 900. The board has facilities for either 2K RAM for user definable graphics or 4K ROM for a 4K Tool Kit Chip. All graphics are software controlled.

Kayde Electronics High Resolution Graphic Software.
16K RAM with Graphics ROM. Cassette: $19.95.

Three programs written in machine code give the true arcade action you have been waiting for in a microcomputer. Space Invaders, Centipede, and Peckman. Extremely difficult and very fast moving.

Digital Integration
ZX81 High Resolution Graphics Pack
16K RAM. £38.95.

Fully programmable 256 x 192 pixel high-resolution display. Hi-Res-Basic Monitor in 2K EPROM includes PAGE, PRINT, PLOT, (inc. LINE), SCROLL, INV, CLS, COPY. Includes lower case character set for word processing. Full dynamic control of USER-DEFINABLE GRAPHICS. Fits between ZX81 and RAM pack. No additional power supply necessary. Handbook included.

Friendly Computer
Draw and Recall
16K RAM. Cassette: $9.95.

Draw on your TV screen and store your drawing to be recalled later. Similar to "Turtle" graphics. You enter an angle and a distance, the program draws the line. Other functions are: move without drawing, erase, delete, display screen position.

Graphics charts for Timex/Sinclair.
$4.95 per pack.

Printed forms allow you to easily plan your displays on paper before coding; save time and tedium. A full 8 ½" x 11" size, they are printed with a grid, line and column numbers, and X, Y coordinate numbers. Packs of 100.

Gladstone
Memotech
Memopak High Res Graphics Pack (A70). $144.95.
4K Graphics ROM (D13). $69.95.

Gives 448 extra preprogrammed graphics symbols, including lower case letters, bombs, bullets, rockets, tanks, complete set of invader graphics. Has a spare holder on the board which will accept a further 4K ROM/RAM. Can be fitted with 1K/2K RAM for user definable graphics. Can use the 4K Toolkit (D14) in the socket.

Nick Godwin
Movies
16K RAM. Cassette: $5 or 3 pp.

Enables you to create and use special moving graphics effect with minimum fuss or effort. Comprehensive drawing board enables creation of images frame by frame. Efficient storage system allows 100s of frames to be stored in 2000 reserved bytes.

Hensley and Associates
Animated Graphics Programming Course
16K RAM. $5.

The amazingly simple step-by-step secrets to creating your own "joystick" animated graphics type games! Free with order of any other Hensley product listed in the Buyers Guide sections.

Kopak Creations, Inc.
Grafix
16K RAM. Cassette: $14.95.

With this program you can draw complex images and save them on tape or put them in your own program.

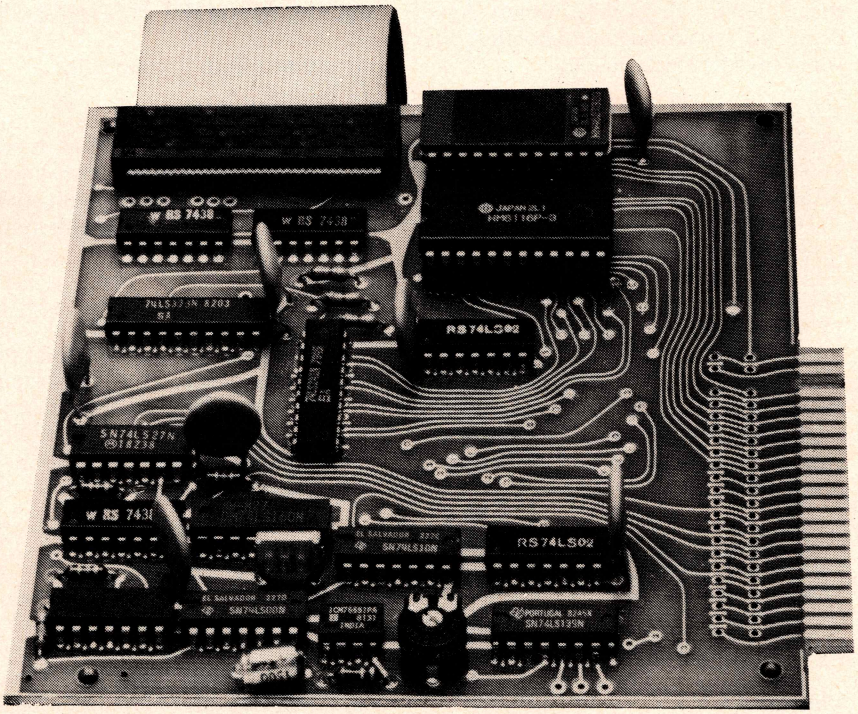
Wm. Maples
Kaleidograph

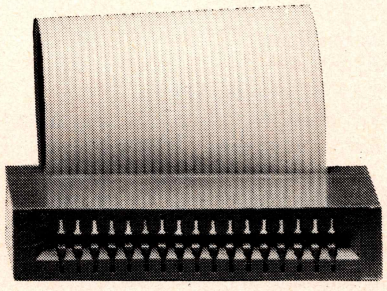
Kaleidoscopic simulation in a 22x22 pixel display composed of randomly selected graphic pixels with 2 axes and a center of symmetry.

Memotech Corporation
Memopak High Resolution Graphics
16K Minimum. $124.95.

The Memopak High Resolution Graphics, with up to 192 by 248 pixel resolution, enables display of "arcade game" style graphics through its resident 2K EPROM, programmed with a full range of graphics subroutines.

FLOPPY DISC INTERFACE





$149 COMPLETE

$119 KIT

Sinclair ZX81 or Timex 1000

Available either completely assembled, ready to just plug-in or in an easy-to-assemble kit with the following features:

- Interfaces with your Shugart SA 400 or any equivalent 35 or 40 track drive system (please specify when ordering)
- Loads 16k program reliably in seconds
- Compatible with all RAM expansions
- Direct plug-in to rear connector or bus expansion
- DOS on 2732 ROM
- DOS commands from direct mode or from your BASIC program.
- DOS commands:

INIT	DSAVE	DLOAD	DIR	STAT
CREATE	WRITE	READ	KILL	NEWD

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Please send details on other new products: ☐ Package Floppy Disc Systems
☐ Keyboard Beeper ☐ Tape Loading Aid ☐ 16K and 64K RAM Packs.

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Address _____
City _____
State/Zip _____

Add $3.50 for shipping and handling. N.J. residents add 6% sales tax.

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Using, continued...

Ken Osborne
ZX81 Window.
1K RAM. £3.99.

Define any number of "windows" on screen. Scroll characters against any background or roll off 1 side of screen onto the other. (wraparound effect including top to bottom). MC routine makes things "fly" around the screen when called from Basic.

Orbyte Software
Graphics I
16K RAM. Cassette: $14.95.

Draw, change, and redraw. Begin and end lines at any point. Draw a design and then move the entire pattern to another screen location. Designs can be memorized by the computer and recreated again. Coordinates of the pattern will be printed out at the end so that you can again create the same design.

Rave Research
Grif Graf
Kit: $19.95; assembled: $24.95.

Programmable graphics generator. Fits inside computer. All our software is available modified for this circuit (same prices). Generates any graphics you can dream up.

Simulsion
Etch-a-Screen
2K RAM. Cassette: $9.95.

Two drawing programs. Etch-a-Screen: Draws text and graphics in any direction; instantly and easily generates pictures; SAVEs on tape or COPYs to printer; with 16K RAM, it can store 19 video slides and then display them in rotation with selected pauses. Crazy Painter: Draws random patterns on the screen with wild brush strokes and manic speed.

Hey, There!
2K RAM. Cassette: $9.95.

Two display programs. Banner: Continuously scrolls a banner of up to 700 giant letters smoothly across the screen; clear, SAVE on tape, or add a message with a single keystroke. Message Board: Displays the first line of up to twenty messages; press a call-letter to view any message.

Softsync, Inc.
Graphics Kit
16K RAM. Cassette: $14.95.

23 Machine Code routines to add graphics to your own programs. draws or deletes multicharacter shapes, creates borders, includes foreground and background functions which makes shapes appear to emerge and fade behind other shapes plus reverse, fill, scroll, and many more. The routines are super fast and when loaded occupy about 2K RAM at RAMTOP. (Licensed from Paul Holmes.)

Graphics Six Pack
1K RAM. Cassette: $14.95.

Six great games on one cassette. Listings of the programs and instructions on how to upgrade and modify them are included in documentation. Twirly Invader: Shoot the man fom Mars. Winding Stairway: Navigate through the winding stairway. Astro Dodger: Avoid flying space debris. Cross The Road: Avoid being hit by passing automobiles. Plus Alien Invaders and Defend.

T-S Systems
Hi-Res Graphics in Action
16/48K TS2000. Listing: $6 plus large SASE.

Takes advantage of the impressive hi-res graphics capabilities of the TS2000.

Multi-Color Images
16/48K TS2000. Listing: $2 plus large SASE.

This small Basic program makes extensive use of the color and hi-res graphics. At the execution of this program a pattern is drawn which changes continuously in shape and color.

Color Hi-Res Helper
16/48K TS2000. Listing: $4 plus large SASE.

A utility program in MC to help you work properly with graphics.

Vidiom
Character Set Graphics Kit
$3.00 and SASE.

Visually spaced, large format letters, numerals, and punctuation. *Not* a program. A fast, easy to use system that gives professional look to your display. Designed for ZX81/TS1000, but can be used for *any* computer with graphics symbols. Instructions and tips with kit.

Bob Woish
Compu-Pen
2K RAM. Cassette: $3; listing: $2.

An "Etch-a-Picture" type program in which you have a choice of characters (Compu-Pen I) or high resolution drawing (Compu-Pen II). Beautiful displays, designs, messages, etc. now possible. Uses full screen.

Word Software
The Drawing System
16K RAM. $17.95 (10% off if *SYNC* is mentioned).

MC drawing program that features 8-directional drawing, 3 drawing modes, full ZX character set, 'smart' cursors, line and screen fill, output to ZX or CAI printers, screen overlaying from tape or memory, and selectable speed repeating keys.

Horizon Simulations
Draw-it
16K RAM. Cassette: $5.

This program will allow you to create 12 screens of pictures and save them on cassette or print them on a printer. You can later modify the picture later.

Educational Programs

American Micro Products, Inc.
Trigonometry
16K RAM. Cassette: $17.95.

Uses a flash card approach to supplement high school math classes and teach the user about calculations involving triangles and parallelograms with numerous graphical examples.

Arithmetic
16K RAM. Cassette: $17.95.

A flash card style learning aid for preschoolers and elementary school children. Aids in learning the fundamentals of addition, subtraction, and multiplication. Oversized numbers make this program especially easy to use.

Home Educator
16K RAM. Cassette: $17.95.

A flash card style program that allows the user to design and write up to eighty flash cards for one package and then save them. This program comes with the states and their capitals entered as a beginning set of flash cards.

Algebra
16K RAM. Cassette: $17.95.

A flash card style learning aid for helping the user learn and study high school level algebra. Specifically, the program deals with the solving of equations with one or two unknowns.

Hangperson
16K RAM. Cassette: $6.
48K Spectrum.

Content for "skeleton" with instructions in REMs for teachers to add their own material. Highly polished hangman format will set 50 words/phrases with graphic or verbal clues.

AVC Software
Electricity
16K RAM. Cassette: $6.
48K Spectrum.

A highly-polished hangman format test game with 50 words/expressions; each with cryptic graphic or verbal clue. The test material is 10-12th grade electricity and magnetism.

Forces
16K RAM. Cassette: $6.
48K Spectrum.

A highly-polished hangman format test game with 50 words/phrases/expressions; each with cryptic graphic or verbal clue. Test material is 10-12th grade dynamics and statics.

Biology 2
16K RAM. Cassette: $6.
48K Spectrum.

A highly-polished hangman format test game with 50 words/expressions; each with cryptic graphic or verbal clue. The test material is 10-12th grade plant and general biology.

Count-Down
16K RAM. Cassette: $6.
16K Spectrum.

Content free "skeleton" with instructions in REMs for teachers/parents to add their own material. Based on a rocket-launch game; allows you to set 10 question tests (random non-repeated questions) at four levels from a 60 item pool.

Tables
16K RAM. Cassette: $6.
16K Spectrum.

A rocket-launch test game. Four levels of 10-question tests; questions coming at random from a 60 item pool, but not repeated.

Similes
16K RAM. Cassette: $6.
16K Spectrum.

A rocket-launch test game. Four levels of 10-question tests; questions coming at random from a 60 item pool, but not repeated. "as . . . as a so-and-so," or "as such-and-such as . . ." 5-9th grade.

Phys Prob
16K RAM. Cassette: $6.
16K Spectrum.

A rocket-launch test game. Four levels of 10-question tests; questions coming at random from a 60 item pool, but not repeated. Solve standard physics data problems using random integral figures. 9-12th grade.

French
16K RAM. Cassette: $6.
16K Spectrum.

A rocket-launch test game. Four levels of 10-question tests; questions coming at random. English-French and French-English vocabulary. For end of year study.
repeated.

Angles
16K RAM. Cassette: $6.
16K Spectrum.

Provides practice, with some help, in use of protractor. 5-10th grade. 8x10 inch acetate simple protractor: $2 extra).

Graph
16K RAM. Cassette: $6.
16K Spectrum.

Plots any input x/y relation over wide ranges of values (user defined). Menu driven with printer option. 6-12th grade.

Forensic
16K RAM. Cassette: $6.
48K Spectrum.

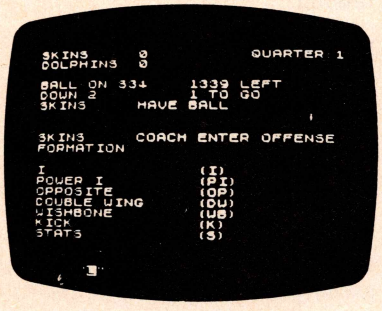
A detection game involving standard chemical qualitative tests. 9-12th grade. Program won an award in the 1982 Sinclair educational computing software competition.

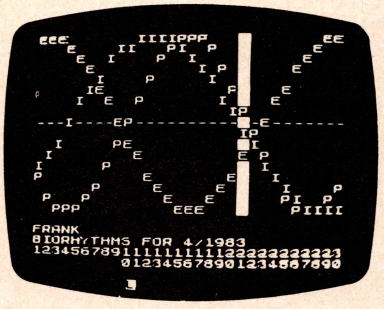
Compound
16K RAM. Cassette: $6.

A game for 1-6 players involving "paying for" qualitative analysis data to determine the target substances. 9-12th grade.

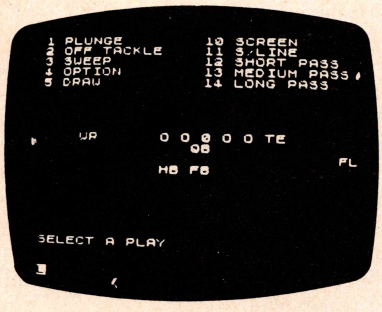
Atoms
16K RAM. Cassette: $6.

A game for 1-6 players involving drill for chemistry and physics courses on





THE VIDEO REVERSER
Reverses entire screen—white letters on a black background. Reduces eyestrain. Small—fits inside case. Works with all programs. A switch can be installed allowing operator to go back to normal video if desired. Easy to install—complete instructions included. USES NO MEMORY. $15.00



WHAT'S YOUR COACHING PHILOSOPHY?
The Oklahoma option, USC I, or a wide open pro style pass offense? Will you follow modern trends like the three man front and the nickle back?

This complete football simulation lets you make all the coaching decisions, while the computer refs the game, runs the scoreboard, and even prints out a stat sheet at the end of the game! Play against a friend or the computer. For 16k RAM Timex 1000 or Sinclair ZX81. $14.95

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If paying by check or money order, indicate amount enclosed: _____
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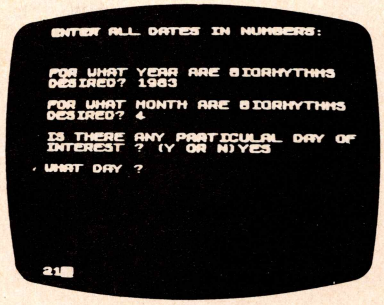


KNOW YOUR GOOD DAYS
KNOW YOUR BAD DAY
Know the days you should stay in bed. Biorhythms is a program that computes and plots three of your ever changing life functions for any time after your birth. For 16k RAM Timex 100 or Sinclair ZX81. $7.95

nuclear and electronic configurations. 10-12th grade.

War Game
16K RAM. Cassette: $10.
48K Spectrum. Cassette: $12.

Named after famous British anti-nuclear war film. (a) presents relevant facts of Hiroshima; (b) offers relevant data pages; (c) provides a simulation in which the user must explore the effects of nuclear explosions on London in a range of variable conditions. Detailed instructions, notes, and references.

Fortune
16K RAM. Cassette: $6.
16K Spectrum.

Fortune telling program gives graphic displays, including zodiac sky for input birthdate and neat random text output. For fun and fund-raising events.

Human 1
16K RAM. Cassette: $6.
48K Spectrum.

A highly-polished hangman format test game with 50 words/expressions; each with cryptic graphic or verbal clue. Test material is 8-10th grade respiration, skeleton reproduction (human biology).

Human 2
16K RAM. Cassette: $6.
48K Spectrum.

A highly-polished hangman format test game with 50 words/expressions; each with cryptic graphic or verbal clue. The test material is 8-10th grade excretion, digestion, health (human biology).

Biology 1
16K RAM. Cassette: $6.
48K Spectrum.

A highly-polished hangman format test game with 50 words/expressions; each with cryptic graphic or verbal clue. The test material is animal biology.

Christian Software
The Ark (2100).
2K RAM. Cassette: $12.95 plus $1.50 s&h.
David and Goliath (2200).
2K RAM. Cassette: $12.95 plus $1.50 s&h.

Bible story games, multiple choice; answers with graphics. $2 for C.O.D.

J. W. Collins
Der Student. (DS1000).
16K RAM. Cassette: $24.95 plus $1.50 s&h.

A self-study German language series of 18 programs, reviews elementary vocabulary and grammatical concepts. Helps the beginner get a good start and serves as an excellent supplement for rapid review.

Computer-Wear Software
Speed Reading
16K. Cassette available 4/82.

Designed by a (2,000 words per minute) speed reading record holder. Demonstrates concepts needed to improve your reading skills/speed. Actual mechanical techniques are synthesized to give you all the benefits once available only from expensive courses. Dealers invited.

DRRP
Proverbs
16K RAM. Cassette: $5.

An exciting game that teaches you the wisdom of Solomon through the Biblical Proverbs. Six degrees of difficulty; contains 60 proverbs; learn the proverbs as you discuss them with your opponents.

Hebrew Tutor
16 RAM. Cassette: $5.

Learn the Hebrew letters, Hebrew spelling, pronunciation, and meaning without pain and struggle of a text book in an exciting and interesting game. 1 or 2 players.

D.S.B.C.
Math Tutor
16K RAM. Cassette: $6.95.

Takes a child from simple counting to multiplication and division. Good for preschool through 4th grade. Kids love the gamelike format. Spelling Tutor available in March 83.

Fisher-Marriott Software
Bomber
16K RAM. Cassette: £6.

The fun tables practice game. Press a key to "bomb" the right answer. Includes 3 other practice games: Numbervaders ("smash" the correct answers), Shootout (how fast can you answer), 4-in-a-row (tables naughts and crosses). Age 6 up.

Bigspell
16K RAM. Cassette: £6.

Spelling practice based on word lists in "Classroom Index of Phonic Resources" by Herbert and Davies-Jones. Incorporates 800 words divided into 115 tests. Each test covers a rule of spelling. Large lowercase letters used. Routine to correct mistakes and help the pupil. Age 5 to secondary level.

Alphabet
16K RAM. Cassette: £6.

Uses big size upper and lower-case graphics. Sections to learn where the letters are on the QWERTY keyboard; to match lower-case with upper-case; to teach alphabetic order. Age 4 up.

Wordplay1
16K RAM. Cassette: £6.

Pit your wits against the computer. Games include: Word-cross: Score points each time you can get words to cross on a grid. Anagrams: Sort out the jumbled letters. Hangman: A neat version of this favorite. Use the word lists in the program or input your own. Age 7 up.

Wordplay2
16K RAM. Cassette: £6.

Word games for 2-6 players. A trial of skill referred by the computer. Games include: Anagrams: Watch the computer jumble your word up, and your opponent sorts it out. Hangman: Avoid a sticky end. ZXrabble: Not really Scrabble, but you get 7 letters and must make the longest word as fast as you can. Age 7 up.

The Count
16K RAM. Cassette: £6.

To help the youngest child, and those who have not yet grasped the concept of number. Presents the basic ideas of number and counting in a friendly and helpful fashion.

Friendly Computer
Trig Teacher
16K RAM. Cassette: $9.95.

Makes it easier, perhaps even fun, to learn the trigonometry functions available in Sinclair Basic. Lots of graphics, pictures, examples. Covers SIN, COS, TAN, ACS, ATN, LN, EXP. Instruction sheet includes a list of formulas to use in you Basic programs. Instructions.

Gladstone
Mathematics Packages
16K RAM. Each package: $24.95.

Package contains: 2 program cassettes, each with 8 lessons and games. Workbook with exercises and games and explanation for parents. Each package covers a grade and complements standard textbooks used in North America. Allows student to proceed at his own speed and level. Programs are self-guiding. Packages numbered by suggested grade level M1 through M6.

Flashcard (Z51)
16K RAM. Cassette: $11.95.

Memory aid and testing device simulating flashcards. You can put questions on one side and the answers on the other. Then give a random, nonrepeating test. Set up math, trivia, memory tests. You

can set up, edit, and save cards. Menu driven.

Heath Computer Services
Multiplication Tables (SBG-568311).
16K RAM. Cassette: $9.95.

Allows user to choose the multiplier for up to 50 problems; a large graphic (YES) or (NO) will appear after each problem; incorrect problems may be listed, showing your answer and the correct answer.

Math Quiz (SBG-568312).
16K RAM. Cassette: $9.95.

Allows user to choose addition, subtraction, division or multiplication for up to 50 problems, with six difficulty levels; incorrect problems may be listed with your answer and the correct answer.

Flash Spelling (SBG-568313).
16K RAM. Cassette: $9.95.

Enter up to 50 words for your child to learn to spell; you determine how long you want the word to be flashed; misspelled words may be listed showing your answer and the correct spelling; word files may be saved on tape.

Hewson Consultants
Countries of the World
16K and 48K Spectrum, Cassette: £5.95.

Makes full use of the Hi Res Graphics and Color capabilities of the ZX Spectrum. Side 1: 16K version; 1) Displays a Hi Res Colour Map of the World, 2) Names all the countries, 3) Shows the position of each country and names its capital. Side 2: 48K version: 16K version plus, 1) Full Colour Map of the World, 2) Displays the Population, currency and main languages of each country, 3) Gives statistics on the largest and smallest country, highest and lowest populations, most and least densely populated.

InfoCenter
Massive.One

Consists of over 40,000 bytes of interactive instructional material plus 5 fast-action, machine code games (many variations) each of which demonstrates one or more points regarding mass, inertia, momentum. Ages: 14 and up. Other educational packages coming.

Instant Software
Geography Explorer-U.S.A. (456TS)
32K RAM. $9.95-$19.95.

This educational program of U.S. Geography is comprised of three lesson sets includes: state's capital, location, area in square miles, population and other information. There are lesson-planning suggestions and study aids. Makes learning interesting to children with animated graphic rewards.

Teacher (455TS)
16K RAM. $9.95-19.95.

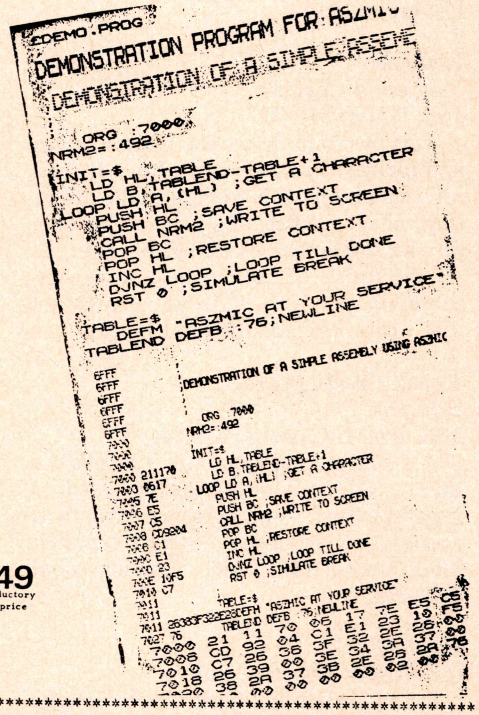
This educational program allows the child to do his lesson independently. A lesson of up to twenty questions with their answers can be stored. The teacher/parent will find it easy to make up the lesson and can change it as many times as wanted. Animated graphic rewards for the correct answer.

Intercomputer Inc.
Eduventure I (ED3001)
16K RAM. Cassette: $12.95.

What greater reward can there be for a young school child than recess? This *Eduventure* requires the child to progress through a variety of "classrooms," encountering a new problem, puzzle or educational game in each. Upon successfully making it through all the classes, the child reaches RECESS and a surprise finish. For grades K-3.

ZX81 MACHINE CODE?

ZX.ASZMIC rom transforms ZX81 into an **Assembly Language** programming unit



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ø POWERFUL DEBUG

All the usual dump, modify, fill & copy commands; plus breakpoints, single stepping, context control, the convenience of interpretive execution mode, full use of the names in your program, Command Macros, autodump, and full operating system interface.

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ø MUCH,MUCH MORE

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Using, continued...

Eduventure II (ED3002)
16K RAM. Cassette: $12.95.

The older child is ready for greater stimulation of the mind than was possible in *Eduventure I*. Solving this adventure requires skill and knowledge in a variety of academic areas. The child increases the speed of his thinking as he tries to avoid the worst of disasters: The Principal's office. For grades 4-6.

Eduventure III (ED3003)
16K RAM. Cassette: $12.95.

In this program Junior High School students have the opportunity to try to outsmart their teachers. They move from class class, facing in each a new situation, which is solved by applying their knowledge and skill. But quick thinking can lead to a shorter solution which brings a greater reward. Be careful. An unsuccessful attempt to outwit the teacher can have disastrous results!

Eduventure IV (ED3004)
16K RAM. Cassette: $12.95.

The sharpest mind is severely tested in trying to negotiate this maze of difficult situations. Each one is different, requiring the application of the student's knowledge and insight to apply unusual solutions to unusual problems. Expands upon classroom learning. The reward is graduation and a real diploma (if you have a printer). For grades 10-12.

Kimtech
States and Capitals
16K RAM. $10.00.

This program draws the United States and divides it into seven regions. It then asks which region is to be studied, draws that region's states, and quizzes the user for the states' names and their capitals. At the finish of each region, a scoring summary is given showing results for that region and for the total lesson.

Kopak Creations, Inc.
Edu-Pak-1
16K RAM. Cassette: $19.95.

An educational program. Teaches the user, reading comprehension, vocabulary, spelling, some sentence structure, and two bonus games: "Super" Number Guesser, Fortune Teller. Coming soon! Edu-Pak 2, 3, 4, . . .

Super Math
16K RAM. Cassette: $14.95.

Drill yourself in addition, subtraction, multiplication, and division with 5 levels of difficulty.

KMC Programs
Help
16K RAM. Cassette: £3.75.

Test pupils' knowledge of times tables in multiplication and division. Illustrates concept of multiplication as the addition of groups and the concept of division as the subtraction of groups.

Coor
16K RAM. Cassette: $£3.75.

3 lessons in Cartesian co-ordinates. The first gives basic facts and illustrates with examples. The second introduces the concept of X and Y axes and point of origin using moving graphics. The third is a game which uses knowledge of coordinates obtained from previous lessons.

KMC Programs
Darts
16K RAM. Cassette: £3.

Provides a realistic game of darts which exercises your ability in number work. Game cannot proceed until you calculate correctly. Correct calculation is also necessary to win the game against the computer.

Mac-Man Software
Alphabet Primer
16K RAM. Cassette: $9.95.

This program introduces the letter A to Z in large graphics. Screen prints letter A and awaits input of any key before proceeding. After letter Z, it returns A but the second run through requires input of the letter shown on the screen to go to B.

Spelling Primer
16K RAM. Cassette: $9.95.

This program teaches youngsters to spell. The screen prints a picture and then a large word naming the object or concept. It then prints the picture and asks for INPUT of the word by user, i.e., SPELL .... There are many moving pictures and this is a visually stimulating program designed to hold children's attention.

Numbers Primer
16K RAM. Cassette: $7.95.

Program introduces digits 1 to 10 in large graphics. Second run through requires user to input to continue. Quantities are depicted graphically as well as by numerals. Last segement allows user to input any number at random and will print that number.

Addition Primer
16K RAM. Cassette: 9.95.

Similar to "numbers" except it adds the various combinations of 1 to 10 and graphically illustrates the quantities and their sums.

Subtraction Primer
16K RAM. Cassette: $9.95.

Follows the same format as the Addition Primer except that the function is subtraction. Addition and subtraction may be purchased as a pair for $15.95.

Multiplication Primer
16K RAM. $9.95.

Program starts with an excellent and simple explanation of multiplication. It then proceeds with illustrated examples as in the above and test problems.

Mac-Man Software
Divison Primer
16K RAM. Cassette: $9.95.

Begins with definition and explanation of division followed by illustrated examples and test problems. *Multiplication and Division may be purchased as a pair of $15.95.

Multiplication Tables
16K RAM. $9.95.

An aid to learning the "times tables." Provides for user to select the multiplier and then prints out the full table for 1 through 12. This is in regular size type as it is for students who know addition and subtraction and the concept of multiplication. Quiz at end.

Mallas Software
Grade Master
16K RAM. Cassette: $15.

Educators save your valuable time. Program computes grade average, median, totals of each grade, range of scores, class average, review individual or all students scores.

Teachers Gradebook (32K)
32K RAM. Cassette: $24.99.

32K version of 16K RAM teachers gradebook available from Timex. Holds 40 students/40 exams. Differentiates and reports averages of quizzes, tests, and quarterlies. Can alphabetize at any point during use and separate boys from girls if necessary. Self-starting, self-saving, printer output. Full support by SASE.

R. Midura
Capitals and States
16K RAM. Cassette: $10.

3 programs. Test your knowledge of the capitals and states, Europe, Middle East, Asia. 3 modes: 1) Given the state, name the capital; 2) given the capital, name the state; 3) random mixture of 1) and 2). Review option gives all incorrectly answered questions. Each quiz consists of a random order of multiple choice questions with the answer randomly placed among 3 randomly selected choices.

Mindware Inc.
From Eagle Sales
Multiple Choice Test
16K RAM. Cassette: $15.95 plus s&h.

Set up virtually any kind of multiple choice test. You can write as many as 30 different test questions each with 3, 4, or 5 possible answers. Questions are randomly posed. A correct answer on the

COBRA RS232C INTERFACE.

At last, a high quality RS232C interface for the ZX81 (TIMEX 1000) to connect you to any RS232C printer.
Look at these features:
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AT AN INTRODUCTORY PRICE OF ONLY $50.00 + $6.00 shipping.

COBRA CENTRONICS INTERFACE

The same high quality as the RS232C except for the output being via a 24 way socket. Both interfaces have the same features. AT AN INTRODUCTORY PRICE OF ONLY $50.00 + $6.00 shipping. We also make every type of lead and plugs for the above interfaces, typical prices.

25 way "D" connector with leads for above 232 $15.00
4 way DIN plug and leads for the above 232 $15.00

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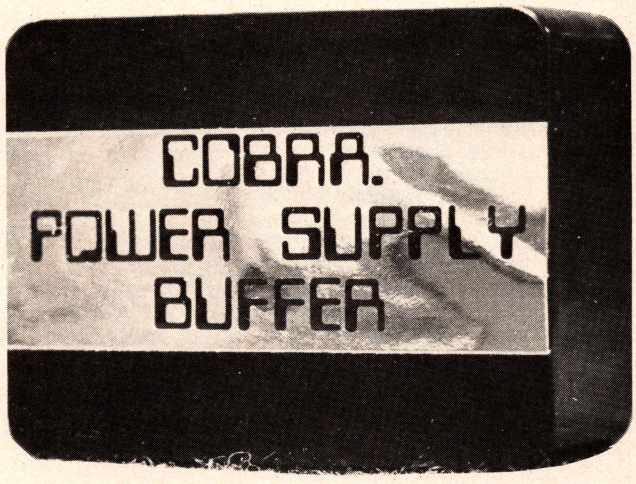

Ever had hours of programming work lost in a moment owing to fluctuations in power or accidental switching of the wrong mains plug?
The Cobra power supply buffer prevents such occurrences affecting you. It is fitted between the Sinclair (Timex) power supply and the computer. During loss of power to the computer the buffer will continue to power the computer with a 9 volts supply for up to 30 minutes or more. It also has mains filtering circuitry to prevent spikes getting through to the computer. The unit will recharge itself during normal power on conditions. When a mains loss situation occurs a red LED will warn the user of loss of electricity supply.

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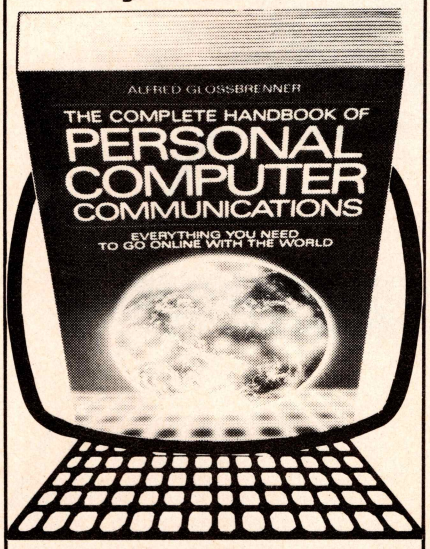

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Using, continued...

first try earns 2 points; the second try earns 1 point.

Word Test
16K RAM. Cassette: $15.95 plus s&h.

The computer poses in random order a series of up to 30 variations on a general test question, e.g., a question like, "What is the state capital of . . .?" It then checks the answers for accuracy and gives 2 points for each correct answer. You can enter a list that you want to be tested on: Practice language drills, vocabulary, and other memorized materials. By Christopher Jones.

Mornae Software
Lingo 1
16K RAM. Cassette: $15.95 plus $1.50 s&h.

French, German, Italian, Japanese, Portuguese, or Spanish language programs. Two-way translator. 16 lessons, each lasting 15-25 minutes, on nouns with articles, verbs, common words. Words randomly selected and repeated when incorrectly answered. Over 350 words with English translation on each cassette.

P. Nethercot & R. Rackstraw
Russian Roulette
3K RAM. Tape only. £2.

At heart a random number generator. Popular with younger children as it gives them a chance to fall down when "shot." Makes nice use of graphic characters. See note in Suppliers Directory.

Mark Total with Averages
1K RAM. Listing: £1.

Overcomes the task of working out average marks when children have been absent. Adds up marks, and where short calculates and includes an average to render the totals comparable.

Mark Sorter
1K RAM. Listing: £1.

Sorts marks into descending order, along with pupil's initials. Much quicker and more reliable than shuffling bits of paper.

Tables
1-3K RAM. Listing: £1.

Generates tables, tests; does not repeat questions in any one test produced. More than 10 questions will require more than 1K RAM. For teacher's use as answers are supplied also.

Ten Tables
1K RAM. Listing: £1.

Displays on the screen 10 multiplication questions. Press ENTER and the answers are displayed for pupils to assess their own results.

Salary
3K RAM. Listing: £1.

Check your payslip, or see what you will get after the next payrise. Designed specifically for teachers. (So no higher band taxpayers catered for.) UK only.

P.60 Check
3K RAM. Listing: £1.

Check that P.60, see if you are due for a tax refund. Aimed at teachers. UK only.

School Fund
16K RAM. Tape only. £3.

Handles school fund accounts, fully menu driven, any number of accounts available, printer routine included. Keep track of who has what in your school fund. Allows for current and deposit accounts. Also available through MUSE. See note in Suppliers Directory.

Class List
16K RAM. Tape only. £3.

The names of your teaching group are held in an array so you do not have to enter the names each time you use the program. Enter the mark for each pupil and a mark order list is produced aong with the deviation from the average for each pupil. Printer option included. See note in Suppliers Directory.

YHA Costs
16K RAM. Tape only. £3.

For those who go youth hosteling. Calculates total cost and cost per individual of visits to hostels. Transport costs may be included. All current YHA prices are included in array with routine for annual updating. Will also printout a booking form to send off to the hostels concerned. Fully menu driven. UK only. See note in Suppliers Directory.

Orbyte Software
The Quiz
16K RAM. Cassette: $14.95.

Math game geared to grades 1-4. 2 levels of difficulty. Choice of addition, subtraction, multiplication. Series of 3 problems appears. Correct answer gives graphic applause. Incorrect answer gives reinforcement by requiring a correct response. Random selection of combinations.

Words
16K RAM. Cassette: $14.95.

Choose category: people, things, animals, food, plants, time, numbers, geography, science, and technology. 450 words in random sequence and scrambled differently each time. Solve scrambled words with 3 tries. After 10 words, score given.

A Parsons

Geography

16K RAM. Cassette: $9.95.

Seven programs: The student has to find towns in the UK or Europe with a series of five maps drawn on the screen. The maps are of Europe, UK, Southern England, South East England and South West England. There is a Town and Country naming program and an English Towns Hangman.

General Knowledge

16K RAM. Cassette: $9.95.

A variety of general knowledge tests: Famous People Quiz, Name the Person, and Where About? Also Dates: Choose the correct date of a historical event. Plus Plurals: Spell correctly the plural of the word printed on the screen.

Eurogame

16K RAM. Cassette: $9.95.

A war game played over the map of Europe for one or two players. Players choose when to attack. Graphics show the map, areas won and lost, and the electronic dice. All 24 lines of display are used. Tape also includes: Cat and Mouse, Maze, and Spy Run.

Maths

16K RAM. Cassette: $9.95.

In response to requests from teachers, this tape has 3 competitive programs for Maths Practice, Plus Bridge Maths, 4 Function Practice, each right answer builds another strut of the bridge; if not completed in 15 tries it falls down. Plus volumes; plus Big Maths, large figures for group use.

Art and Fun

16K RAM. Cassette: $9.95.

Six programs: Noughts and Crosses, Battleships and Board Game. Sketch Pad: Allows the user to draw a picture, copy it if a printer is connected, record it to play again, and watch it re-draw the picture. Plus two fascinating pattern generators.

1K Fun Learning

1K RAM. Cassette: $7.95.

Learn spellings, add in hours and minutes, price quantities of groceries or give change. Plus four function sums with whole figure answers and score. Plus tables.

16K Fun Learning

16K RAM. Cassette: $9.95.

Six programs including: Word Sums: Invites you to add amounts shown in words, not figures. Areas: Gives the pupil exercises in working out areas and perimeters with guidance if required. Translation program for English and French words. An English Vocabulary Test. Two versions of the very popular Hangman.

Polymath

Educational Aids Program

16K RAM. Cassette: $19.95 pp.

Solve and check mathematical equations quickly and accurately. Solve quadratic, cubic equations, polynomials, factor numbers, solve for x and y, plus more. Menu driven. Turns your computer into a private tutor. Documentation.

Rose Cassettes

Intermediate Maths 1

16K RAM. Cassette: £4.95.

Six programs which first teach and then test, using generated numbers: 1) Long Multiplication: Allows for entry of all working starting from the RH end. 2) Long Division: All working shown on screen. 3) Highest Common Factor. 4) Lowest Common Multiple. 5) Fractions 1 (add and subtract). 6) Fractions 2 (multiply and divide). Each program has a different incentive jackpot game with moving graphics. Correct answers and running totals shown. Appropriate help facilities plus a printed certificate.

Intermediate Maths 2

16K RAM. Cassette: £4.95.

Based on the same format as *Intermediate Maths 1*: Areas (7 basic shapes), Perimeters (5 shapes), Simple Equations, Percentages, Sets and Venn Diagrams.

Intermediate English 1

16K RAM. Cassette: £4.95.

6 teach and test programs: Meanings (of words) 1, Meanings 2 (higher level), Parts of Speech, Proverbs, Similes and Anagrams. Each program has a different jackpot game incorporated with moving graphics. Correct answers and running totals shown, plus a certificate. Help facilities in Parts of Speech and Anagrams.

Intermediate English 2

16K RAM. Cassette: £4.95.

6 teach and test programs: Idioms, Opposites 1, Opposites 2, Group Terms, Odd Word Out and Spellings. Each program has a different jackpot game with moving graphics. Questions are multiple choice using RND selection. Certificate given.

"0" Level Maths Revision

16K RAM. Cassette: £4.95.

3 programs: 1) Teaches and then tests using generated numbers. Menu choices of a) Matrix multiplication, b) Inversion of a matrix, c) Multibase Arithmetic: Addition, d) Multibase Arithmetic: Subtraction, e) Calculus: Differentiation, f) Calculus: Integration. 2) and 3) are timed tests, using 30 questions based on the "0" level syllabus. Explanations are given where appropriate. Numbers are generated.

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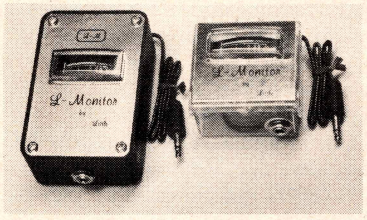

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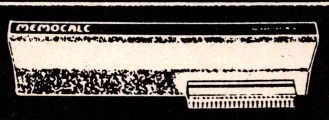

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6 programs. 3 teach and test grammar programs:
Verbs, Pronouns, Adjectives; and 3 comprehensive vocabulary programs: Vocab 1 (nouns), Vocab 2 (Verbs), Vocab 3 (Common Expressions etc.)

Primary Arithmetic
16K RAM. Cassette: £4.95.

4 programs: Add, Subtract, Multiply, and Divide. Numbers in large size type. 3 levels: 1) Units only, 2) Tens and Units, 3) Hundreds, Tens, and Units. Questions are asked, e.g, "Do you need to borrow one?" "What shall I carry forward?" A correct answer adds a features to a balloon face; an incorrect answer erases a feature. When all features are present, We have liftoff! (machine code). Printer gives hard copy of incorrectly done sums.

Educational Quiz
16K RAM. Cassette: £4.95.

4 quiz programs. Questions cover: General Knowledge, Reasoning, English, and Maths. RND function is used. See if you can beat the clock. Time penalty points are incurred if you are too slow. Suitable for all the family.

D. Rowland
Quiz Grader (1)
1K RAM. Listing: $1 plus SASE.

Grades tests and quizzes in which all sections are equally weighted; basic but efficient.

Test Grader (2)
2K RAM. Listing: $2.

Similar to *Quiz Grader* but also handles differently weighted sections in a test.

Test Grader with Group Printout (3).
2K RAM. Listing: $2.50.

Similar to *Test Grader* but prints out results every 10 students then recycles for next group.

Test Grader with Grade-System Option (4)
2K RAM. Listing: $2.50.

Similar to *Test Grader* but user can change grade system without changing program listing.

Super Grader (5)
16K RAM. Cassette: $9.50.

Deluxe menu-driven test grader with many options and error corrections provisions to assure user that typed in data are correct.

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"O" Level-Physics, Chemistry or Biology.
48K RAM. $8.

"O" level study packs include revision book, hints on how to revise, problems, and multiple choice questions.

"O" Level Maths Parts I & II
48K RAM. $5.50.

"O" level study packs includes revision book, hints on how to revise, data randomised; different questions each time.

Junior School Maths
48K RAM. $5.50.

Jungle Maths: +, -, ×, ÷. Pass through a jungle by getting the sums right, but watch out if they are wrong. Astromaths: Decimals, Fractions—play a space game but only if the answers are right.

Paul Shreeve Software
Primary Maths Package
16K RAM. Cassette: $10; Listing: $3.00 (inc. s&h).

Tables test, fractions game, area game, make simple math fun for elementary grade children.

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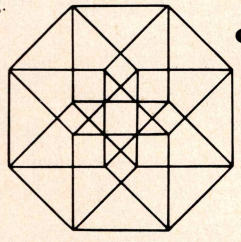

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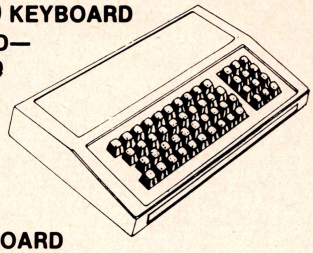

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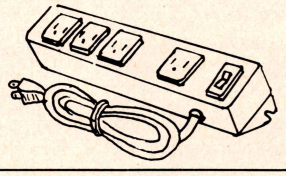

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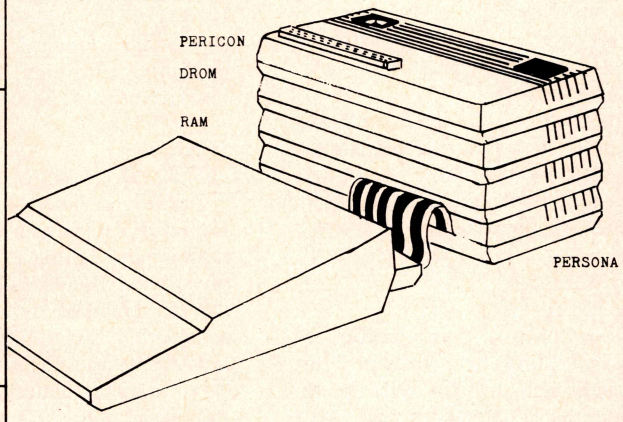

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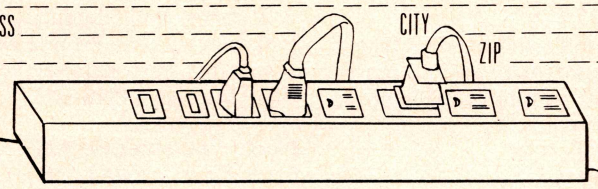

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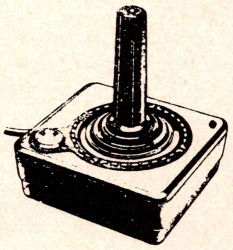

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Compute equipment depreciation on the straight line, sum-of the years-digits or double declining balance. Special Feature: double declining balance converts to straight line according to the proper accounting formula and allows for a salvage value of 0 when required.

Break-Even Analysis
16K RAM. $4.95.

Computes unit sales and dollar volume of sales necessary to reach a break-even point, beyond which profits are gained. Various retail prices can be input to test their effects on the break-even point.

Gladstone
Property Manager (D22)
16K RAM. Cassette: $24.95.

Provides for any combination of 10 units in 2 buildings or 2 units in 5 buildings per program. Additional units handled by running a new copy of the master file. Program tracks each unit for rent, up to 15 variable expense categories, 15 fixed expense lines. For one year.

Personal Financial Planning Pack (Z53)
16K RAM. Cassette: $29.95.

2 tapes and detailed reference/instruction manual. Programs: Checkbook Balancing, Personal Net Worth, Budget Plan, Mortgage Plan.

Heath Computer Services
Cash Register (SBG-56837).
16K RAM. Cassette: $9.95.

Totals, figures sales tax, clears and keeps daily totals.

Human Engineered Software
Budget Master 1000
16K RAM. Cassette: $15.95.

An invaluable household budget program for the new Timex/Sinclair 1000. Features full user control to create your own categories as well as display totals in monthly, year to date and average format.

Kopak Creations, Inc.
The Budgeter
16K RAM. Cassette: $15.95.

This program can keep track of your personal budget and expenditures.

Automatically loads above RAMTOP, it is like extended Basic for your TS1000 or Sinclair ZX81.

Accounts
16K RAM. Cassette: $19.95.

Small business or home accounting system.

Manufacturing Control
16K RAM. Cassette: $19.95.

Lets you compare labor and manufacturing cost of 150 products.

Personal Records Storage System
16K RAM. Cassette: $29.95.

Personal records are easily stored with this program.

D. Lipinski Software
Inex
16K RAM. Cassette: $10.

An income and expense sheet style program for purchases, payment, interest, beginning balance and current balance for over 99 different user accounts including standard deductions, net pay and total income. Add/delete account names, list to screen or printer, transfer balances to set new account period. Self expanding to the available memory size.

Markel Software
Financial Record Keeper (16K RAM)
16K RAM. Cassette: $14.99.

Files one year's record in 20 user defineable areas. Printer output. Menu driven. Month by month totals, year to date totals, review individual files, or all totaled. Full maintenance routine. Self-starting, self-saving, self-naming (according to the year entered). Full support by SASE.

Financial Record Keeper Plus (48)
48K RAM. Cassette: $24.99.

All the applications in *Financial Record Keeper (16K RAM)* plus the ability to hold 500 checking transactions. Checks listed according to a number of options (date, check no.) or by endorsee. List year to date totals by endorsee or category. Checkbook reconciliation routine included. Shows which checks have cleared the bank.

Mohr & Associates Corp.
Financial Planner
16K RAM. Cassette: $25.

Software for the insurance man. A complete CNA packaged for the aggressive insurance man. Balances the client's assets, provides retirement and insurance planning.

Tax Favored Programs
16K RAM. Cassette: $25.

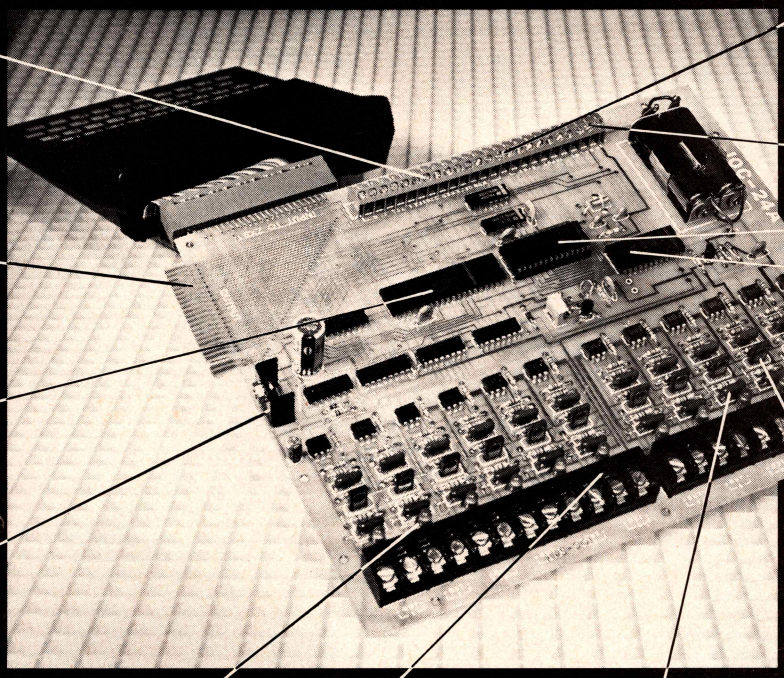
For the IRA, annuity salesman. Gives comparison of other financial packages such as CDs, mutual funds vs. Tax deferred annuities (KEOGH/IRA/TSA/SPDA/Flexible Annuities).

P. Nethercot & R. Rackstraw
Budget Account
16K RAM. Tape only. 3.

Keep track of where the money goes; see why you are always in the deficit at the end of the year. Allows for annual review, printout status, shows amount budgeted per item, amount spent and balance remaining, percentage, and total spent each month. Menu driven.

COMPLETE CONTROL FROM YOUR TIMEX - SINCLAIR 1000

By GCM Electronics, Inc.



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Your Timex/Sinclair can be used for more than just balancing your checkbook! Coupled with the IOC-24, you now have a powerful control for your world. Using the flexibility of the IOC-24, you can utilize your Timex/Sinclair to control and monitor your lights, burglar alarm, sprinkler system, TV and stereo – even your coffee maker.

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A free sample program with thermistor to display temperature and activate an output channel is provided.

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SINWARE provides these quality machine code programs for the ZX81/ TS1000:

HOT Z

HOT Z is a disassembler, editor and debugger that provides a new approach to help you solve the mysteries of programming in fast and efficient machine code. Let the reviewers say it for us:

"The more experienced ML programmer will find the use of* HOT Z *quite refreshing. The usual hassles of code entry, editing and debugging are virtually eliminated."
SYNC 2/6

"If you program in machine language and need the best tool for the job, buy* HOT Z. *This program will never lose its value."
SQ #1

Z EXTRA

Z EXTRA is a display manager and data filer that lets you enter text, data or pictures directly to the screen and save them in groups in memory, on tape or in print. Display them sequentially or in scrolls through one another or use them in your BASIC programs.

S.U.N. Newsletter: ***"We found this to be the best display manager program we've seen for the ZX/TS. Typically of Sinware, the documentation is more thorough than you will receive with any other package."***

TSUG Newsletter: **"Z EXTRA** ***bears out the reputation of its creator as well as the implication of its . . . name: an extra dimension is added to your computer with*** **Z EXTRA."**

SINWARE's other products are two new utilities for BASIC programmers: **STEP**, the ultimate BASIC debugger, and **Z-TOOLS**, for the convenience of merging, renumbering and tape verification.

PRICES

STEP	**Cassette**	**$14.95**
Z-TOOLS	**Cassette**	**$14.95**
Z EXTRA	**Cassette**	**$19.95**
HOT Z . . . 16K or 32K +	**Cassette**	**$19.95**
HOT Z-E . . . . Four 2716 EPROMs		**$40.00**

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Santa Fe, NM 87504

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Bob Norman
Financial Analysis
16K RAM. Cassette: $8.95.

Financial analysis of retirement and investment savings. Standard savings and IRA's, showing tax, interest, retirement income, inflation, comparison, and plot.

Orbyte Software
Home Budget
16K RAM. Cassette: $14.95.

Keep running balance of family finances. Details sample budget. 3 major categories: Income, Deductible Expenses, Non-Deductible Expenses. Small businesses can also use it as a tool for finance management.

Oxford Computer Publishing Ltd.
Finance Manager for Spectrum and TS2000.
48K RAM. Cassette: $19.95.

MC program handles over 2000 entries in up to 255 separate accounts. Full Screen input, cursor control, and amendment, makes this program particularly easy to use. Facilities include automatic double entry, instant account balances, regular payment facility, and cash flow calculations. Individual accounts may be listed, updated or printed out.

A Parsons
Treasurer
16K RAM. Cassette: $9.95.

Analysis Book keeps records of up to 15 columns, user-defined either credit or debit, 400 entries can be made with date and detail shown. Balance readily accessible. Full accounts can be printed. Plus Address book for 110 Names and Addresses, Search by Name, Category number, Town, Street, even part of a name, and print mailing labels.

Peak
Dataplot
16K RAM. Cassette: $10.

Dataplot plots stock prices, scientific data, etc. Plots positive and negative free formated data stored in REM statements. Can be used with your printer. Draws and lables axes, titles your plot, draws figures, plots from an equation and will plot on a grid.

Sensible Technical Solutions
Easy Z Financial Transactions (413).
64K RAM. Listing: $10; Cassette: $15.

Works with 16, 32, 48. This program will handle all your different accounts (credit card, store credit, checking, savings, etc.). Menu driven, self-modifiable, load and save on tape, complete prompting through entire program). Tax deductible.

Easy Z Accounting (128)
64K RAM. Listing: $15; Cassette: $20.

Works with 16, 32, 48. Complete double entry accounting system. Journals (cash receipts, cash payments, purchases, sales, general, and petty cash). Ledger (cash, expenses, inventory, merch. sales, merch. purchases$_0$, other accounts can be entered to customize program. Outputs to screen, standard Tax Deductible.

M. Sieder
Programs 16-101 to 16-106 on one cassette (6 programs): $75.

Sales Journal (16-101)
16K RAM. Cassette: $15; listing: $2.

Work sheet for cash, cheque, and A/R sales giving printout of detailed distribution and totals for G/L entry plus verification.

Accts. Receivable (16-102)
16K RAM. Cassette: $15; listing: $2.

30 accounts by name and number with 10 entries each plus balance. Schedule of A/R, transfer of balances for new entries plus printout.

Accts. Payable (16-103)
16K RAM. Cassette: $15; listing: $2.

Similar to *Accts. Receivable*.

Aux. Bank Book (16-104)
16K RAM. Cassette: $15; listing: $2.

Work sheet with distribution, totals, and printout for G/L entries of 45 cheques in and 30 cheques out per day plus deposit slip printout.

General Ledger (16-105)
16K RAM. Cassette: $15; listing: $2.

30 identifiable balance and P+L accounts. Ten entries each per account. Trial balance and daily P+L statement, printout, transfer of balances for new entries.

Simulsion
Bank and Tax Register
16K RAM. Cassette: $9.95.

A check register to store a year's transactions: number, date, category, and amount for each item; recall by any combination of factors (e.g., all checks over $100 dated 1/83 to 3/83 in the category AUTO EXP). Easily add, change, and delete entries. Can print with headings on screen or printer with totals and grand totals.

Skinner Electronic Enterprises
Personal Finances. Part I.
16K RAM. Cassette: $12.95; listing: $7.95; $2 s&h.

8 routines using compound interest to calculate accumulated interest, time to accumulate, rate of return, investment

required, future value, future value with daily compounding, conversion to effective annual rate, and conversion of addon interest to APR.

Personal Finances. Part II.
16K RAM. Cassette: $12.95; listing: $7.95; $2 s&h.

3 routines for calculating IRA account balances using single annual, regular monthly, or irregular monthly deposits. 5 routines using simple interest to find total interest paid, time to accumulate, rate of return, investment required, and future value.

Softsync, Inc.
Advanced Budget Manager
16K RAM. Cassette: $16.95.

This program combines a financial data base with a forecasting program. Choose from the menu to input or review data, analyze income/expense (projected and actual) by month, category or by total; six income and twenty-four expense categories; built-in save feature and print routine; easy to operate with self-explanatory instructions.

Software Development Associates
Home Budget (F100)
16K RAM. Cassette: $12.95.

A home financial planning program that lets you budget your expenses into 15 accounts. A blank cassette is included with Home Budget on which to save your data.

Auto Record Keeper (F101)
16K RAM. Cassette: $15.95.

Keep a record of such items as gas, oil, repairs, car payment, insurance etc. Various screen displays provide year to date expenses, miles per gallon, and cost per mile.

Syber, Inc.
Financial Manager 1000
16K RAM. Cassette: $15.95.

A completely integrated business/home Budget, Expense, Checking, and Financial Management System. Maintains monthly and year to date data for up to 35 user defined categories; numeric and graphic output along with menu driven operation.

SyncMaster
Financial Analyzer
16K RAM. Cassette: $14.95 + $1 s&h.

Three programs include: (1) Calculate payments, interest rate, total amount or period; enter three, calculate fourth. (2) Loan amortization with optional principle pre-payment; save lots of money on your mortgage. (3) Future value of an IRA, using variable interest assumptions.

Timeworks, Inc.
The Money Manager. (1301).
16K RAM. Cassette: $16.95.

Input sixteen budget and actual categories on a monthly basis for a 12-month period. Full analysis is provided including budget and actual comparisons, and detail by individual items. Bar charts provide graphic representations of budget and actual amounts for each period. Store information on tape for updating, revision, or reference.

UAS
Budgeting. (C7001).
16K RAM. Cassette: $7.95.

The program guides you through the generation of a practical way to budget. Significant expenses are highlighted and suggested corrections are derived by recursive routines.

Spreadsheets

Banta Software
Screen-Calc
16K RAM. Cassette: $19.95.

Electronic spreadsheet; up to 450 user-defined entries, input data or calculate results; any entry can be defined in terms of any other entry; built in summing and averaging or rows and columns; any entry can be located by name. Useful for business, budgets, bookkeeping, or inventories.

Hensley and Associates
Economical Accounting Spreadsheet Program
16K RAM. Cassette: $15.

A powerful multi-calculation and "what-if?" tool with which to generate an endless array of reports, charts, forecasts, schedules, projections, and analyses. Our product allows access to the program itself to enable the user, with a little study of simple arrays, LET statements and FOR-NEXT loops, to completely design his own spreadsheets to fit his exact needs, rather than the program's.

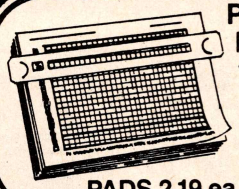
Kopak Creations, Inc.
Vu-Calc
16K RAM. Cassette: $19.95.

Constructs and generates, calculates, large tables for budget sheets, financial analysis, and projections.

Memotech Corporation
Memocalc
$49.95.

Memocalc, our spreadsheet analysis software on EPROM enables TS1000 users to perform complex number crunching routines with ease. With a 64K RAM a table of up to 7000 numbers with up to 250 rows or 99 columns can be specified.

pleasanTrees
PICK OF THE CROP FOR 16K!



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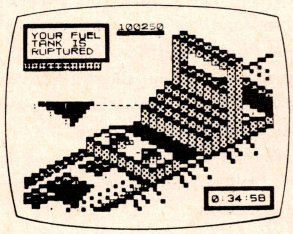

16K XON! '81 or 1000

City of Xon!
Scrolls 3 dimensionally. Your shadow follows below as you avoid hazards. Various weaponry help you rack up points. *Most impressive graphics your machine can exhibit.* In M.C. **19.95**

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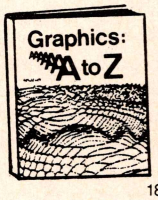

For HRG
- Terms dictionary
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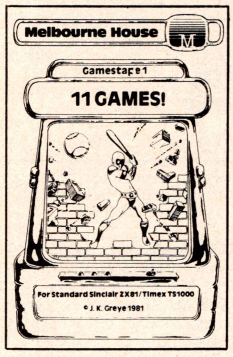
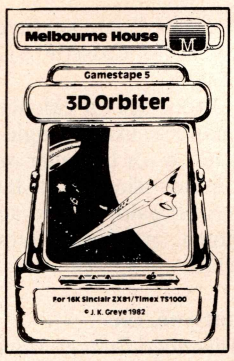




GAMESTAPE 1
GAMESTAPE 1 with 11 great games for your standard TS1000/ZX81 has achieved to fit into the standard machine what others require 16K to do! Games ranging from arcade games and word games right through to an amazing machine code wallbusters game! "I was very impressed with the amount which had been packed into the standard machine" – ZX Computing. "The wallbusters game is the best TS1000/ZX81 version of this game I have seen" – Which Micro.

GAMESTAPE 2
GAMESTAPE 2 brings you three great programs for the TS1000/ZX81 with 16K: STARFIGHTER – a superb machine code space battle, with twinkling stars and stunning explosions! PYRAMID – a thinker's game; ARTIST – the ultimate graphic designer's aid.

"The gamestapes are a fine range of software. All programs ran the first time with no bugs. All can be recommended" – Which Micro? "Good value for money" – Computer & Video Games.

GAMESTAPE 3 – CATACOMBS
GAMESTAPE 3 for 16K TS1000/ZX81 is a multi-level graphics adventure that is not limited in its scope. Each level can contain up to 9 rooms, 8 passages, as well as monsters, food, gold, traps, phantoms... "An excellent addictive game which will keep you amused for hours" – Computer & Video Games.

GAMESTAPE 4 – 3D MONSTER MAZE
GAMESTAPE 4 for 16K TS1000/ZX81 is the game to top all the others! Unbelievable graphics! Can you find your way through the 3D Monster Maze, with a T. Rex chasing after you? You've never seen anything like this! "If I had to choose just one program to impress an audience with the capabilities of the TS1000/ZX81, then 3D Monster Maze would be the one" – ZX COMPUTING "3D Monster Maze is the best game I have seen for the ZX81" – Computer & Video Games "The graphics are superb" – Which Micro? "Brilliant, brilliant, brilliant!" – Popular Computing Weekly.

GAMESTAPE 5 – 3D ORBITER
GAMESTAPE 5 for the 16K TS1000/ZX81 is the ultimate space game! In amazing 3D graphics, you battle against marauding invaders. Using the keyboard like a joystick, you can climb, bank and dive in 3D, as the ground slips past and the bad guys prepare to attack. "Amazing graphics effects are created as the enemy draws closer, more and more detail appearing as the flying saucers zoom in. Another winner!" – Sinclair User "The best way I can sum up this game is 'GREAT'" – ZX COMPUTING.

COMBAT FLIGHT
In this fantastic new arcade game you are the death-defying commander of a sturdy fighter ship, flying through dangerous mountainous terrain, while alien ships hell-bent on destroying you are coming at you. Beware! Even if they don't get you they may leave dangerous flak. Don't crash into the mountains and don't fly too high, either way you'll never live to fly again! Keep a steady hand at all times and your wits about you.

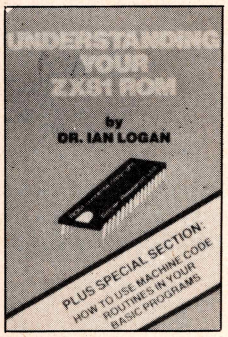
SPACETREK
In this fantastic space simulation the exciting TV program now comes to your Sinclair ZX81/Timex TS1000. You are in command of the Starship Endeavour, and the galaxy – made up of 64 sectors – is being invaded by Drakons. Your mission is to seek them out and destroy them before time and fuel runs out! Five degrees of difficulty from easy to impossible! Good luck, Commander!

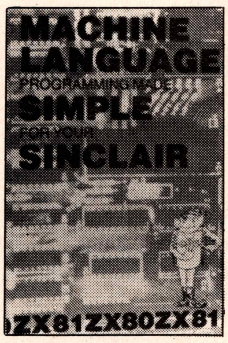
TOOLBOX
Toolbox contains three superb utility programs on one tape:
DIRECTORY is a most useful program if you find yourself with tapes of programs and can't remember what's on them – This program will 'listen' to the tape and display the names of the programs on the tape. RECORD is a program that allows you to save data onto tape and read it back into the program at a later stage. RECORD can be incorporated into your own BASIC program, and is ideal for name and address info, short data blocks, etc. Its use is limited only by your imagination. TOOLKIT. The amazingly compact TOOLKIT allows you to achieve better graphics effects in your own programs, as well as help you write your BASIC programs more quickly and more efficiently. With commands such as, 'No Inverse', 'Inverse', 'Reverse', 'Fill', 'Free', 'Renumber', 'Find & Replace' and 'Open' you will find this a most useful program.

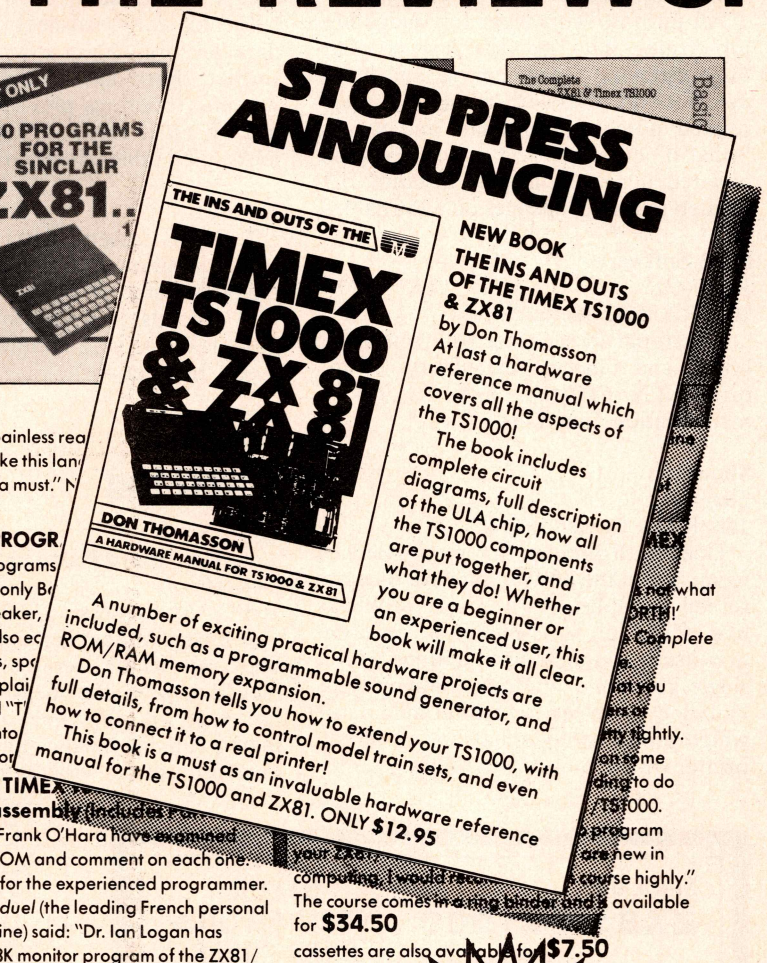
Plus award winning books

THE COMPLETE SINCLAIR ZX81 & TIMEX TS1000 BASIC COURSE
The *SYNC* review says: "It has been said, 'It's not what something costs that counts; it's what it's WORTH!' That certainly seems true in the case of *The Complete Sinclair ZX81 & Timex TS1000 Basic Course*. The course begins with the assumption that you know practically nothing about computers or programming and holds your hand pretty tightly. However, later chapters go into depth on some very valuable material for those intending to do significant programming on the ZX81/TS1000. If you have any interest in learning to program your ZX81/TS1000, especially if you are new in computing, I would recommend this course highly." The course comes in a ring binder and is available for **$34.50**
cassettes are also available for **$7.50**

IT . . . READ THE REVIEWS:







UNDERSTANDING YOUR ZX81 ROM
by Dr. Ian Logan

SYNC Magazine said: "SYNC readers will recognize Dr. Logan as a major ZX80/81 expert whose writings are well worthwile. *Understanding Your ZX81 ROM* is no exception. The book falls logically into five parts: a brief review of the Z80 CPU, next a quick introduction to the internal arithmetic and number base manipulations; a discussion of the Z80 machine code instructions grouped by function; a detailed examination of the relevant parts of the 8K ROM; Dr. Logan introduces machine code programming by treating it as an extension to Basic; and complete listings of the more important 8K ROM routines are given as well as the usual tables of machine code language instructions, decimal-hexadecimal conversions, and keycodes. Understanding Your ZX81 ROM should be high on your list." Now available for only **$14.95**

MACHINE LANGUAGE PROGRAMMING MADE SIMPLE

Michael Roberts, *SYNTAX* Magazine wrote: "I wanted to review this book because I'm the person it was written for. I taught myself BASIC and can now do most of the things I want to with it. I felt that Machine Language would be a good addition to speed up some programs and improve display. The idea of Machine Language 'made simple' appealed to me. It's the best explanation of Machine Language for Machine Language beginners I've seen. Its friendly style is painless rea
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This introduction is a must." N
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THE COMPLETE TIMEX
ZX81 ROM Disassembly (Includes F

Dr. Logan and Dr. Frank O'Hara have examined all routines in the ROM and comment on each one. This book is a must for the experienced programmer. *L'Ordinateur Individuel* (the leading French personal computing magazine) said: "Dr. Ian Logan has disassembled the 8K monitor program of the ZX81/TS1000. For those who want to write programs in machine language, it is PART A which is the more interesting, because it contains the majority of BASIC commands, while Part B is far more technical, comprising essentially of the ZX81/TS1000's floating point calculator. In conjunction with *Understanding Your ZX81 ROM* this book allows anyone well

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☐ 26359	Super Invasion-1K	$14.95
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☐ 26406	Toolbox-1K	$14.95
☐ 26490	Basic Course 2 cassette pack	$7.50
☐ 14026	Combat Flight-16K	$14.95

BOOKS:

☐ 25895	The Complete Basic Course	$34.50
☐ 25957	Machine Language Programming Made Simple	$14.95
☐ 20922	The Complete Timex/Sinclair ROM Disassembly	$19.95
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☐ 25913	Understanding Your ZX81 ROM	$14.95
☐ 51539	Ins and Outs of the Timex TS1000	$12.95

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MELBOURNE HOUSE SOFTWARE

Using, continued...

Mindware Inc.
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Matrix Planner
16K RAM. Cassette: $22.95 plus s&h.

All purpose worksheet for budgeting, job costing, data analysis, business planning, estimating, engineering, and home use. Sets up rows and columns of interrelated numbers, formulas, and words, "what if" questions (e.g., price revisions, lowered tax rates) can be instantly calculated to reflect changes on all variables.

P&B Software
Video-Calc
16K RAM. Cassette: $9.95.

Electronic spreadsheet with scientific, home, and business calculations. Supports ZX printer, has all ZX81 mathematical functions.

Simulsion
Easy Calc
16K RAM. Cassette: $9.95.

Does math directly. Enter a problem or formula and the answer appears. Ten on-screen variables, A to Y, for problems like (4*D)/Tan A. Each can be an equation itself; run systems equations with a single keystroke. Various configurations included such as a printer-calculator which produces columnar output on the printer with subtotals and totals.

ZX81 Programs
Compusheet
16K RAM. Cassette: $10.

Electronic spreadsheet program. Enter data or formulas in a row and column format. Formulas include all ZX 81 numeric functions plus special ones for adding up a series of numbers or for looking up tables. Instructions.

Fastsort
16K RAM. Cassette: $10.

MC program that sorts up to 255 floating point numbers stored in a Basic array in 4 seconds. A comparable Basic program takes over 16 minutes in the FAST mode. Instructions.

Checking

American Micro Products, Inc.
Checkbook
16K RAM. Cassette: $17.95.

A means of keeping a personal checkbook. Allows the user to enter such information as dates, the check payee, a check use code, and the check amount. Maintains a running balance and searches the database using several different criteria.

Cottage Technology
ACZ Check Register
16K RAM. Cassette: $9.95.

Does more than balance the checkbook; summarizes expenses by accounts; allows allocation of one check to several accounts; this is a stand alone system; it can directly transfer the accounts summary into the ACZ General Ledger.

CRC Software
Check Book
16K RAM. Cassette: $12.95.

Keep track of all your checks. Gives balance after each entry. Lists checks by month. Search for the checks by Payee or by check number.

Statement Aid
16K RAM. Cassette: $9.95.

Helps you to balance your checkbook against your bank statement each month.

Custom Electronics Device Corp.
Checking Account

Designed to work with *E-Z Bookkeeping* but can be used alone. Keeps up to 200 checks in one file. Checks are numbered automatically; categorize by account or vendor number. Enter a number and the name is typed for you. Accounts and vendors can be changed as you want. Write for details.

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ZX81/TS1000

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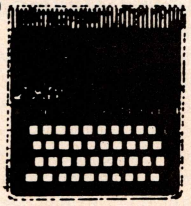
MULTI-FORTH for the 2 K+ SINCLAIR - $49.95



Multi-tasking FORTH for the ZX81 and TIMEX/SINCLAIR 1000. MULTI-FORTH turns the SINCLAIR into a flexible real time controller.

Example of Multi-tasking:

TASK taskname programname (ENTER)
(This creates a task called taskname.)
IN 20 TM taskname EVERY 1 TS taskname (ENTER)
(This schedules the task after 20 minutes have elapsed. The programname will run every 1 second.)

TASK OPTIONS: LOCK; UNLOCK; START; STOP; RUN; You can run up to 10 tasks simultaneously; Each task has its own 32 bit clock which is modified every clock tick (1/60th second).

MULTI-FORTH comes in a an EPROM on a circuit board and contains most of the standard fig-FORTH words. The BASIC chip plugs into the board to allow switching between FORTH and BASIC.

UNIQUE EDITOR: The visual editor is on split screens and is cursor oriented. Characters can be inserted, or deleted. Lines can be inserted, deleted, compiled, or stored temporarily in the pad. The entire editor screen can also be compiled.

MULTI-FORTH turns the SINCLAIR into a real time controller of:
-Data acquisition -Home environment controller
-DC Servo Controller -Even a model railroad controller

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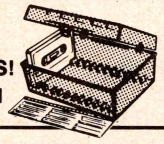

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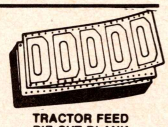

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ZX81 TS1000

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TWO GAMES FOR THE PRICE OF ONE (ONLY $12.95)
All programs 16K

MACHINE LANGUAGE PROGRAMS

ASSEMBLER $16.95

2 pass assembler written especially for the ZX81/TS 1000 (16K). It is simply the best assembler available for those who wish to write their own machine code programs. It is designed to run alone, or together with the dis-assembler, and/or the de-bugging program. These provide a system for writing, editing, checking and testing machine code programs that is second to none.

DIS-ASSEMBLER $16.95

Allows you to read the ZX81/TS 1000 ROM (16K) with the best dis-assembler program available. It is written specifically for Sinclair/Timex computers, and unlike some programs modified from Intel 8080 dis-assemblers it gives full Z80 Mnemonics.

DE-BUGGER $16.95

Makes writing machine code programs easier. Works entirely in decimal. Therefore hexadecimal is not needed. (16K)

PROGSTORE / TOOL-KIT $16.95

Progstore contains a series of machine-code routines that create 3072 bytes of user space and then transfer into this space machine-code routines that allow the transfer of a BASIC program into the user space after running this program allow a return to another BASIC program stored conventionally in low memory.

TOOL-KIT

Progstore toolkit contains four "utility" programs specially written to operate from progstore. Having loaded progstore in Toolkit can be loaded and then progstored with RAND USR 32500. Each program can be run by RAND USR 32723.

HEXLOADER—This program allows machine code programs to be rapidly written in hexadecimal.

HEXLISTER—This program complements HEXLOADER by allowing machine code programs to be listed in hexadecimal.

PROGMERGE $16.95

Progmerge contains a series of machine-code routines which allow BASIC programs to be stored whole or in part.

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Using, continued...

Heath Computer Services
Checking (SBG-56833).
16K RAM. Cassette: $9.95.

Lists up to 25 deposits showing deposit and date; lists up to 80 checks; lists by account the total of the checks written; keeps total of checks written and balance left in account; adds interest, subtracts service charges; searches for check by number, name, date or amount; prints lists of deposits, accounts, and checks with ZX or compatible printer.

Hilton Computer Services
Personal Banking System
16K RAM. Cassette: $20.

Banking program supports datafiles; automatic posting of standing orders on correct dates; facility for listing (with printout) by category with totals.

PBS Bank Reconciliation Module
16K RAM. Cassette: $10.

Used in conjunction with *Personal Banking System* to match bank statements and PBS records automatically. Highlights all discrepancies, lists uncleared checks, etc. and offers full correction facilities.

D. Lipinski Software
Check
16K RAM. Cassette: $10.

A check book for 200-400 transactions. Automatic check number and date entry. Listing of items by outstanding items, name, date or check number either to the screen or printer. Entry errors are correctable. With simple reconciliation you get the bank statement balance.

R. Panwar
Checkbook Record
16K RAM. Cassette: $14.95.

Store checks, deposits, running balance.. Find total deposits, total checks. Search by user defined codes for various categories. Helps in budgeting. Stores data for the whole year.

Simulsion
Checkbook Balancer
2K RAM. Cassette: $9.95.

Checkbook Balancer: Reconciles your bank balance to your checkbook balance with a running tabulation and display of both; stores and lists up to 100 uncleared checks and deposits. Graphic Checkbook: Graphic presentation of your ups and downs; generates a four year bar graph of your monthly bank balance.

Timeworks, Inc.
The Electronic Checkbook. (1304).
16K RAM. Cassette: $16.95.

Organize and record checking transactions: check or deposit number, description or comment, date, classification code (groceries, entertainment), and amount. Checking balance is computed. Sort and recall transactions by date, description, and classification. A real help at tax preparation time. Store up to 1000 transactions on a single C-60 cassette.

Z-West
Checkbook Helper
16K RAM. Cassette: $4.95 plus $1 s&h.

The computer steps you through the program asking for information necessary to examine your checking balance; informs you of any error or balance of your account.

ZX-Panding, Ltd.
Checkbook, Income Tax, and Budget Organizer
16K RAM. $13.75 plus $1.25 s&h.

Ten jobs in a menu-driven format. Checks and deposits are totaled and itemized under user-defined categories for budget planning and income tax preparation. Makes checkbook balancing easy and 90 transactions can be manipulated at one time with 16K.

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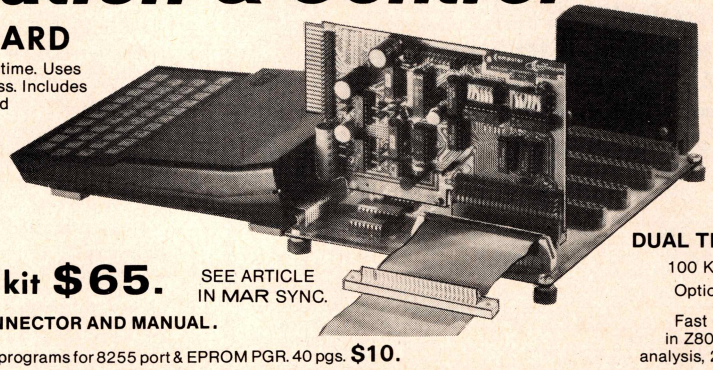
ANALOG INTERFACE BOARD

8 channels A/D + 8 channels D/A. 1.6μS A/D convert time. Uses BASIC or machine code. Does NOT need Buffered Buss. Includes parts for piggyback to ZX/TS & RAM. Many jumper and switch selectable options. Has features which allow easy interfacing to other micros. Tested on ZX/TS, Apple, TRS-80, CBM 64, others. Manual w/software. You must see spec sheets to appreciate this board.
$230.



NEW SOFTWARE FOR ANALOG BOARD:

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100 Khz w/zoom **$25.**
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Fast Fourier Transform in Z80 code for spectral analysis, 256 point. Inquire.

BUFFERED BUSS– DEVELOPMENT BOARD: kit $65. bare board **$35.** WITH CONNECTOR AND MANUAL.

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APPLICATIONS BOOK FOR 'BUSS': Plans & programs for 8255 port & EPROM PGR. 40 pgs. **$10.**

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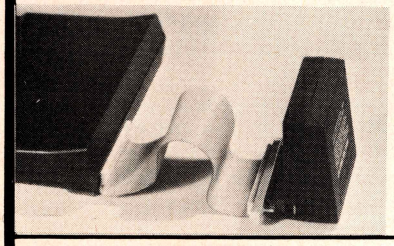

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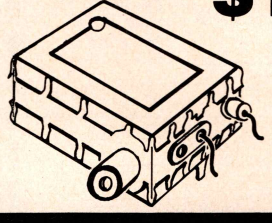
switch to ch. 33 **$15.**



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Inventories

American Micro Products, Inc.
Home Inventory
16K RAM. Cassette: $17.95.

A specialized database routine for keeping an inventory of household possessions. Allow the user to search the files for a particular item or to list all items with a value above a specified value.

Asia Tsucho Co., Ltd.
Data Putting
16K RAM. Cassette: $12.

Outputs distribution ratio of the total by grouping every and all the data input; displays a linear graph of the ratio. Especially suitable for uses such as calculating the amount sold, the purchasing cost, and expenses.

Bug-Byte Software
Multifile
16K RAM. Cassette: £17.50.

Versatile, multipurpose filing system. Number, size, and headings of files are user-definable. Create, modify, replace.

Russell Brewer
Fast-file
16K RAM. Cassette and instructions: $9.95 plus $1.50 s&h.

New time and space saving menu driven filing system for the TS1000/ZX81. Unused portion of the file is not saved or loaded, but is still available to the user. Fast machine code searching, comprehensive machine code editing.

John B. Carson, Jr.
U.S. Savings Bond Listing
16K RAM. Listing: $2.50.

Lists series, issue date, serial number, and denomination for 25 bonds. Edit functions permit: add/delete, make changes, increase/decrease the total number of bonds listed.

Data-Assette
Inventory Control
16K, 32K, 48K, 64K RAM. $19.95.

Programmed to work with our ZX99 Tape Control System or as a stand alone, this program allows stock control of units and of values with separate routines for receipts and returns or sales and shipments. SORT by code or alpha name. Quick access to stock levels.

Gladstone
Inventory Control and Stock Analysis (D23)
16K RAM. Cassette: $19.95.

First in a series. Stock control of units and values, separate routines for receipts, returns, sales, shipments, adjustments in units and values. Uses average cost for inventory value and shipments. SORT by code or alpha name. New feature will allow expansion for 32K or 64K RAM.

Heath Computer Services
Inventory (1) (SBG-56834).
16K RAM. Cassette: $9.95.

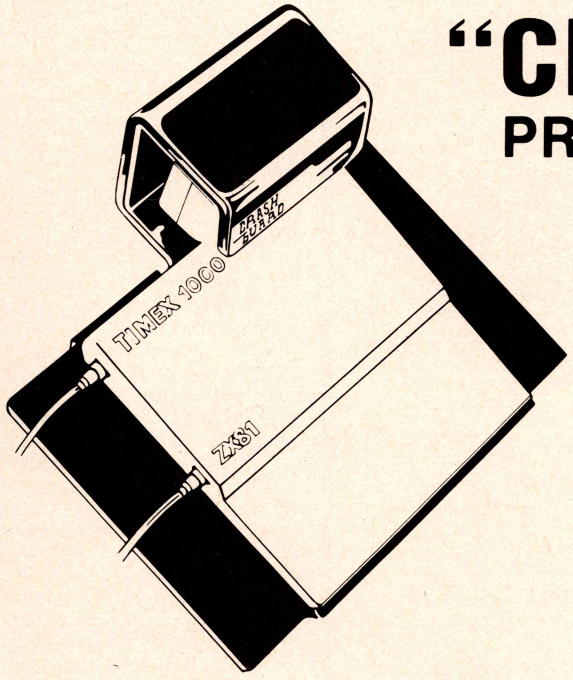
May be used for everything from keeping an accurate inventory for your business, to your personal record collection; holds up to 150 items with comments for each; comments may be serial numbers, dates, prices, or location; list all items, searches for single item, change or delete any item; print list of items.

Inventory (1) (SBG-56835).
64K RAM. Cassette: $9.95.

May be used for everything from keeping an accurate inventory for your business, to your personal record collection; holds up to 300 items (no comments); list all items, searches for single item, change or delete any item, print list of items and quantities.

Sales File (SBG-56831).
16K RAM. Cassette: $19.95.

Holds 150 products w/wholesale and retail prices; totals wholesale and retail prices; holds up to 25 accounts; records inventory automatically or manually; keeps running total of sales tax. Cash



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PROTECTS YOUR ZX81 AND 16K RAM MODULE
$19.95

* Eliminates crashes caused by bumping the 16K RAM module
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register mode identifies, totals, and adds sales tax while automatically keeping records for your bookkeeping. Prints list of products, accounts, inventory.

Sales File (SBG-56832).
64K RAM. Cassette: $19.95.

Holds 600 products w/wholesale and retail prices; totals wholesale and retail prices; holds up to 100 accounts; records inventory automatically or manually; keeps running total of sales tax. Cash register mode identifies, totals, and adds sales tax while automatically keeping records for your bookkeeping. Prints list of products, accounts, inventory and sales receipts.

M. C. Hoffman Co.
Universal Inventory File
16K RAM. Cassette and manual: $16.95.

User creates file headings following prompts. Auto-RUN/SAVE. Menu format. Two ways to search, add/delete, check, and more. Make hundreds of useful programs with this filing system.

Universal Record Album Collection

Universal Baseball Card Collection

Universal Stamp Collection

Universal Coin Collection

Universal Comic Book Collection

Universal Mailing List

16K RAM. Cassette and manual: $10.95 plus $1.50 s&h.

Kopak Creations, Inc.
The Stamp Collector

Using your TS1000 you can inventory up to 600 Scott numbers in a single session showing quantity on your hand, by major classification.

Inventory
16K RAM. Cassette: $19.95.

Automatic Overstock/Understock detection, Automatic Print, Mathematical Calculations also done at user command, Search for an item, delete, add a new item, input a new inventory list.

Autofile
16K RAM. Cassette: $19.95.

Electronic filing system: allows you to set up your own database.

D. Lipinski Software
Inven
16K RAM. Cassette: $10.

Total inventory accounting program for quantity purchased, sold, balance on hand, cost, replacement costs and accrued values. Search or change item by description, category or stock number. Complete list to screen or printer. A description of 32 characters and stock number of 3 digits has 103 entries in 16K RAM.

List
16K RAM. Cassette: $10.

A data entry and retrieval program for groups of information. List up to 4 categories of your choice. View, add, delete, print or mass search any info in any and all categories. A 16K RAM will yield 150 entries with 8000 characters in the field but may be expanded if you have more memory.

Stock
16K RAM. Cassette: $10.

Keep count of items. Add, delete, search, change items by description, item number or category. Complete list to screen or printer. With 16K RAM & having an average description of 32 character and a 3 digit item number you would have 197 items. A 20 character average would be 265 items.

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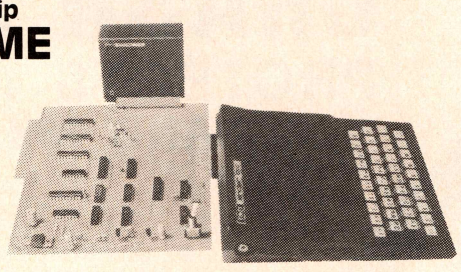
Compatible with ZX80/81
MicroAce & TIMEX™ 1000

8 lines departing
(outputs capable of driving relays)
8 lines arriving
(TTL COMPATIBLE INPUTS)



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Comes Complete With
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- 90 day warranty

Future Products
- Touch Tone™ encoder/decoder
- Speech and Sound synthesizer

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320	325	A to D and D to A converter	$47.95 $19.95
330		Wireless control system (BSR™)	$69.95
340		Solid State AC Relay	$19.95
SPECIALIZED PARTS FOR MODEL 315			
316		Sinclair edge connector, 46 pin w/key	$12.95
317		Clock IC and crystal (tested)	$ 4.95

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TS-ART

TS-ART helps you create graphics on the screen with a pencil, an eraser, about 120 brushes, a video inverser and a "flicker". You can easily move these tools in 8 directions or along lines or circles which are drawn, erased, painted with a brush, video inversed or "flickered". You can set a different background to any quarter of the screen. You can define new graphic commands — for example one that "does" a square. Then by pressing only one key you can make any of the tools to do a square anywhere on the screen; so a square can be drawn, erased, painted, and so on. And the square can be rotated and it can be compressed or expanded to any size. And it can be used as a building block for other commands you define. And you can save or print the artwork. And . . .

TS-ART is fun; is a screen editor that can mix text with graphics; is a smart educational device (ages 4 to 99) that indirectly teaches (LOGO style) concepts in arithmetic, geometry and computer science.

All this power (and more) for only $12.95 (add $1.50 for postage and handling in U.S. or $2.50 outside U.S.). Check or money order in U.S. $. VISA or MC accepted. Satisfaction guaranteed or your money back.

For TS1000/ZX81 with 16K RAM.
KSOFT, 845 Wellner Rd.,
Naperville, IL 60540.

Management Services Co.
SYSDTA
16K RAM. Cassette: $9.95 pp.

Comprehensive 1K machine code input routine as on large commercial computers. Input from anywhere on the display. Easy user interface through one string variable and GOSUB. Data types entered, validated, and displayed including strings, numerics, compacted numerics, dates, and verify prompt.

Mindware Inc.
From Eagle Sales
Inventory Control
16K RAM. Cassette: $22.95 plus s&h.

2 programs. Stock I: Keeps track of 400 line items, with product names and descriptions, unit prices, supplier codes, stock levels, and reorder points. Changes in prices, codes, and deletions easily done. Provides alphanumeric list of items or breakdown by type of supplier. Stock II: A simpler program that allows for 2000 items. Updates on both programs take only seconds. By Hilderbray Ltd.

Forecasting and Graphs
16K RAM. Cassette: $22.95 plus s&h.

Takes raw data, and projects sales, profits, inflation, and other trends. Computes a moving average that smooths out seasonal and random fluctuations. Stores up to 15 time series of 60 periods each. Analyzes growth rates, correlates 2 separate trends, computes mean and standard deviation. Results can be displayed in graph form.

The Fast One
16K RAM. Cassette: $24.95 plus s&h.

A computerized filing cabinet. Stores, keeps track of, and instantly retrieves all kinds of data, e.g., mailing lists, inventories, personal finances, recipes, collectables, club membership lists. Data records can be updated and searched quickly. Instructions; requires no special computer training. By Campbell Systems.

Orbyte Software
Home Inventory
16K RAM. Cassette: $14.95.

List all your household inventory. Maintain up to date valuation of all assets. Useful for insurance purposes. Small businesses can keep current summary of inventory. Ability to log categories, descriptions, inventory numbers, current and replacement costs, remarks.

A Parsons
Stockbook
16K RAM. Cassette: $19.95.

Written by experienced business user. Keep records of 400 lines of stock, quantities of up to 255 cost and selling prices of up to $655. Stock levels adjust as subs are entered, Prints stock tickets and full stock list. Plus supporting programs. Printer needed.

Practical Computer Products
Graphpak.
16K RAM. Cassette: $14.95.

Visually represents statistical data with line graphs, pie charts, vertical bar graphs, and area graphs. Printer compatible and fully listable. Useful for lab analysis and great for business and home statistics.

R. A. Tec.
Inventory (BIOIO)
16K RAM. Cassette: $13.

Keep track of your inventory; holds up to 300 items per tape. Each item includes: name, code number, quantity, and 2 vendors. Menu and INKEY$ driven.

M. Sieder
Inventory (16-106)
16K RAM. Cassette: $15; listing: $2.

30 identifiable items and numbers plus 10 entries each, instant balance, inventory listings with total movement/item, transfer of balances and printout.

M A Smith
Business Stock Control Program
Spectrum 48K. £19.50 pp. Sterling Money Order.

Menu driven routines include initial stock set up, financial summary, MIN/MAX levels, update/add/delete facilities. Coding data schedule.

Support Systems One
ICP/1
16K RAM. $15.95.

Inventory Control, totally menu driven, auto run, nine pre-selected data fields in one file. Features: Auto file-search, file creation, file deletion, change data fields, interactive receive and shipment programs, item sales history to date; up to 200 files.

Syber, Inc.
Spectrex
16K RAM. Cassette: $15.95.

Creates true perspective drawings from user defined data points; viewing angles may be changed at will; data is entered only once and is maintained by resident file manager.

SyncMaster
Insurance Records
16K RAM. Cassette: $14.95 + $1 s&h.

Complete record-keeping of household/business belongings. Keeps track of costs, dates purchased, descriptions, serial numbers, assessed values, etc. Combine with photos of small items for complete recovery in case of fire or burglary. Multi-tape capability if needed.

Timeworks, Inc.
Data Master. (1307).
16K RAM. Cassette: $14.95.

This general information storage and retrieval system makes index cards and messy files obsolete. Store information on such subjects as: Christmas card lists, recipes, club lists, client lists, vendor lists. For reference, information can be recalled by name, date, amounts, etc.

The Insurance Property Record. (1303).
16K RAM. Cassette: $14.95.

Protect yourself against unnecessary property loss by organizing and cataloging your possessions. Information stored includes item description, serial number, cost, purchase date, store where purchased, and location of item. Items can be recalled by any of these categories. Store up to 1000 items on a single C-60 cassette.

The Collector's Companion. (1302).
16K RAM. Cassette: $14.95.

Organize and catalog your collectibles by description (name, serial number, code number), cost, current value, insured amount, and purchase date. System automatically calculates appreciated value and tells you which items are underinsured. Retrieve by category. Store up to 1000 items on a single C-60 cassette.

UAS
Library. (C1001).
16K RAM. Cassette: $6.95.

Organize your books and magazine articles by subject, location, author, title, and also have a key word or phrase search. You can choose the search that you want for each item.

Thomas B. Woods
ZX Data Finder
16K RAM. Listing: $9.95.

A high capacity information storage and retrieval tool. 2 ways to search, full edit control, documentation gives a line-by-line explanation of how the program works and analyzes functions necessary for good data base design.

ZX Pro-File
16K RAM. Cassette: $19.95.

Machine language data base. Store up to 12000 characters in files of any length. Single or multi-word cross searches, extensive edit and display functions. Manual.

Eric Yruegas
Record Keeping
2K RAM or more. Listing: $2; cassette: $5. SASE.

Keeps track of items in home. Room for comments (serial numbers, location, etc.).

ZX-Panding, Ltd.
Data Storage and Display System
16K RAM. $14.75 plus $1.25 s&h.

Stores up to 60 data points in up to 25 files under user-defined titles. Data can be recalled in either a tabular form or as a solid graph with a data summary table.

Appointments

CRC Software
Bill Master
16K RAM. Cassette: $12.95.

Tells you with blinking calendar your financial timetable. Tracks paid and unpaid bills with subtotals and totals.

Appointment Planner
16K RAM. Cassette: $12.95.

Keeps track of all your appointments. Lets you list out your appointments by day, month, or you can search for any appointment. Includes any year perpetual calendar. Dates on which you have any appointments blink.

H & H Electronics
Memo Board
16K RAM. Cassette: $9.95 plus 75¢ s&h.

This program may be used as a message center in your home or as a way to send messages to your friends with a ZX/TS computer. Easy to use program includes scrolling display and full editing functions.

Heath Computer Services
Appointment Calendar (SBG-568310).
16K RAM. Cassette: $9.95.

May be used for everything from reminding you of birthdays to business appointments. Enter the date and list up to (8) appointments per day for up to (31) days; change or delete any appointment; prints a list of appointments for the day or month.

Intercomputer Inc.
Occasion Calendar (HM5004)
16K RAM. Cassette: $14.95.

Keep track of birthdays, anniversaries, meetings, and all other special events. Check ahead a day, week, or month at a time and not miss any occasion that might otherwise have been forgotton. Record special notes, such as gift preferences, which will appear alongside each list.

Bill Organizer (HM5001)
16K RAM. Cassette: $14.95.

Keeps track of all your bills, stores amounts and dates due, minimum payments, and finance charges. Schedule your payments by computer as it organizes your bills according to due dates. Summarizes and totals all bills from the same vendor and displays your annual costs, e.g., electric, at the end of the year. Tax deductible finance charges are also totalled.

M. Sieder
Tele Memo (16-201)
16K RAM. Cassette: $15; listing: $2.

15 memos of 500 bytes each, plus date, address, subject and signature for storage, telephone transmission and printout.

Simulsion
Appointment Calendar
16K RAM. Cassette: $9.95.

Keeps memos for any date this century. Produces a full screen calendar for any month with appointments highlighted. Type the appointment day, and the memo appears. Appointments can be easily added, updated, and cleared. 2nd proram: Telephone Address and Mailing List: Recall entries by name or category (e.g., Christmas list, Bills).

SyncMaster
Yearly Datebook
16K RAM. Cassette: $14.95 + $1 s&h.

Keep track of important, long range dates with this easy to use program. Enter dates for family birthdays, anniversaries, insurance payments, etc. Add full descriptions. As each month begins, list by date, month, or year.

Timeworks, Inc.
Forget-Me-Not. (1306).
16K RAM. Cassette: $14.95.

Birthdays, anniversaries, and special occasions are important to remember, but sometimes forgotten. You can now have all noteworthy dates easily within reach with the push of a button. Dates can be sorted and recalled by classification. Record a dentist appointment, project deadline, or your boss's birthday to be recalled daily, weekly, or monthly.

Word Processing

Aerco
WP-1 Word processor package.
16K RAM min. $15.

Facilitates preparation of documents and handles any size printer. Provides blinking cursor, keyboard features, insert/delete, tab, etc.

Barlog Software
Texter
16K RAM. Cassette: $7.

This text editor allows you to store up to 400 lines of text ZX Printer compatible. The 16K version will handle 64K RAM (or whatever you have) with little modifications. Instructions included. Listing: $2.

Custom Electronics Device Corp.
Word Processor

Enter text line by line or a paragraph at a time. Edit function allows editing in any way on each line. Shift a line position one space at a time, left or right, center lines. Tab feature. Write for details.

P. Hargrave
Word Sinc
16K or more RAM. Cassette: $12.50.

A word processor for the Sinclair, or other 32 column, printer. Holds 9,000 characters with 16K. Easily expanded for larger memories. Menu controlled. Full screen cursor control for changes and corrections. Fast machine code routines to insert variables, move, list, and justify the text. Instructions.

Kopak Creations, Inc.
Wordfix
16K RAM. Cassette: $19.95.

A word processing program.

Management Services Co.
SYSDOC
16-64K RAM. Cassette: $9.95 pp.

Word processor. A full function text editor featuring: totally menu driven selector; user defined file size; over 11,000 characters for text on 16K; edit, move, and delete text; positionable tabs for text alignment; continuously updated text display; comprehensive documentation.

Maranatha
Text Processor

Fast mode operation for quickness. WRITE, EDIT, DISPLAY, SAVE or LPRINT your text. Specify 16, 32, 48, or 64K RAM.

Mindware Inc.
From Eagle Sales
Z-Text
16K RAM. Cassette: $19.95 plus s&h.

A word processing program to edit your written text. Justifies margins, allows revision and replacement of any part of the text; excellent for form letters. Displays up to 32 characters per line and 22 lines of text and will move text up and down rapidly. Sets up page formats and searches for key words.

Peak
Text & Prodir
16K RAM. Cassette: $10.

Edit and save pages of letters, address books, etc. with Text. Recall pages without splitting words at the end of a line.

Text can be used with your printer. PRODIR is a programmed directory to organize your programs and ease loading.

Textii
16K RAM. Cassette: $20.

Edit and save pages of any text without splitting words. Has an adjustable number of characters per line to accomodate any printer. Includes PRODIR to organize programs and ease loading, a search to locate words and a line renumbering routine for easy insertions.

Soft Way
Text Tape 2
16K RAM. Cassette: $10.95.

BOOK: Edit-Tab/Transfer/Review/LPrint/Save. 20 pages. LIST: Edit/Save/Search/Review. 2500 items. A-Z: Alpha-Numeric Sort with Save.

SyncMaster
Vu-Write Text Editor
16K RAM. Cassette: $14.95 + $1 s&h.

Easily document spreadsheets and other programs with full insert, delete, move, and print text. Completely menu-driven, 11K free RAM for documents. Define file size, set tabs and start writing. Complete documentation on cassette.

Miscellaneous Programs

American Micro Products, Inc.
Home Brewing
16K RAM. Cassette: $17.95.

Teaches the user to brew beer at home. Instruction includes: equipment, procedures, ingredients, and recipes. The program takes the user from preparing the wort to the final racking of the beer in a stepwise and logical progressing.

Apropos Technology
Dr. Floyd
16K RAM. Cassette: $10. pp.

Psychoanalysis by Computer? Well not quite, but Dr. Floyd will carry on a conversation with you using psychoanalytic techniques, giving the appearance of artificial intelligence.

Banta Software
Beam Design
16K RAM. Cassette: $19.95.

Calculates shear force and moment diagrams for statistically determinent beams with concentrated and uniform loads; finds normal and shear stresses for given section or section modulus for a given section.

Pipe Flow
16K RAM. Cassette: $19.95.

Calculates the Reynolds number and friction factor for a given flow condition and finds the head loss in piping systems which include straight pipe, bends, valves, contractions, and enlargements.

Home Heating Costs
16K RAM. Cassette: $6.95.

An analysis of effects of types and amount of insulation, building size and configuration, climate, and various fuel costs. See what you really can save by using alternative fuels for all or part of your building.

Computer-Wear Software
Demo
16K RAM. Cassette.

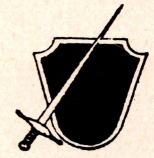
A software package for all Timex/Sinclair 1000 Retailers, distributors, and marketing managers. *Demo* is not for retail sale but was designed specifically to help sell more merchandise for you. Your TS1000 with 16K RAM can now be your best salesperson. Contact us for free details, prices, quantity discounts.

Verlin K. Cross
10 Programs for the ZX81
Food Programs: $5 each; all others: $3 each.

Examples of input/output and instructions. 6 on statistics: Student, Paired Observations, Correlation, Linear Regres-

adventure game!

BMS



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Evansoft Associates
Runners' Programs:
Pace and Splits Calculator. (R10).
Runner's Log. (R20).
First Marathon Training Planner. (R35).
16K RAM. Cassette: $7.95 each; 2K RAM versions: $5.95 each.

Executive Workshop
The Ultimate Forecast
16K RAM $4.95.

Forecast your personal or business future with Tarot Cards, shuffled and dealt by your computer. Shows the position and significance of each card, name of the card, and if the card is reversed.

Pro Football Forecast
16K RAM. $4.95.

Measures each team on 16 points including, coaching, weather, injuries, etc. Lists selected winner and expected point spread. Successfully picked all NFL playoff games this year within 2 points—but totally missed the Super Bowl. *Free with purchase of any 3 other programs.

Gladstone
Program of Days (Z45)
16K RAM. Cassette: $11.95.

A historical databank. Organized to provide insight and information regarding historical events. Find out what famous persons and events occurred on your birthday.

Project Scheduler and Proposal Sheet (Z50)
16K RAM. Cassette: $14.95.

Project Scheduler: Record project est. hrs., hrs. to date, remaining hrs., billing rate, employees involved; display amount billed, current billing, estimated billing remaining. Proposal Sheet: Record work items and hours; hourly billing rates; display overheads, material costs, labor totals.

Signals and Morse Codes (Z57)
16K RAM. Cassette: $14.95.

Learn and practice Semaphore, Blinker Lights, and Morse Code (including sound). For each code you can see or hear the numbers and alphabet in order or any number or letter you choose. You can receive random letters or numbers and messages and be tested on any of the codes. Use the messages and tests in the program or insert your own.

Weight Control Diet Program (Z47)
16K RAM. Cassette: $29.95.

Helps gain control over eating program; not a diet, but an individually tailored, systematic weight loss program. Uses a Personal Status Assessment with the computer as your monitor and feedback system. Track yourself against your model. Weight Control Guide Book gives instructions. Personal data tape for monitoring progress is supplied.

Just Drop in Software
Program tapes
2K RAM. Cassettes: $14.95 pp. each.

Specializes in software for the TS1000 without additional memory. Tapes with programs duplicated on side two; minimum of 5 different programs per tape. Titles include: Address Book, Bank, Anti-Ballistic Missile, Blackjack, Slot Machine, Hangman, Lunar Lander, and more.

Wm. Maples
Stopwatch
1K RAM. Listing: $1.50 pp.

Times events to 9 1/2 minutes in length; accurate to 1/10 sec.

ABC, Etcetera
2K RAM min. Listing: $1.59 pp.

Alphabetizes lists of names, titles, terms, etc. 20 characters long. Length of list: 65 for 2K RAM, add 50 for each additional K. 700 maximum.

Mindware Inc.
From Eagle Sales
Critical Path
16K RAM. Cassette: $19.95 plus s&h.

Picks out the steps in a project that could become bottlenecks, monitors costs, spots effects of delays. Some steps must be completed before the next can begin; others can be delayed without slowing up the project as a whole. Applications include construction, manufacturing, marketing, public administration, and many other. By Hilderbray Ltd.

Orbyte Software
Running
16K RAM. Cassette: $18.95.

A computerized guide to running. Computes all information necessary for a personalized, well-rounded running schedule. Advice on diets, exercises, equipment. Helps solve problems common to the sport, keep a "running log" of your progress, stabilize the level you have already attained, and coach you in building to higher levels, even to marathon status.

P&B Software
Espanol
16K RAM. Cassette: $9.95.

English-Spanish and Spanish-English bilingual dictionary. In addition to basic vocabulary, *Espanol* learns new words and phrases from the user and adds them to its own vocabulary.

Robill Products
Cypher 9
16K RAM. Cassette: $29.95 + $1.50 s&h.

Cypher 9 is a menu-driven, multi-featured cipher generator with encode/decode/scramble and two save options for secure communications. Frequency analysis is inhibited and convenient cipher changing allows security comparable to "one-time pads."

Simulsion
Party Nibbles and Bites
16K RAM. Cassette: $9.95.

Peggy DeRose offers 12 easy, ultra-fast party recipes. Select a letter from the menu and a recipe instantly appears. Includes: bean, cheese, and salmon dips; a cheese ball; pigs-in-a-blanket; and more. Room to add your own variations and favorites.

Bartender's Window
16K RAM. Cassette: $9.95.

A menu of drinks appears on the screen, offering an instant recipe mixing guide. Press the call-letter of any drink and its mixing directions immediately appear. Designed to overcome the problem of mixing drinks in dark places and to provide a stimulating answer to the question: Why is that computer sitting at the end of the bar? Program by Sean La Motte.

UAS
Job Jar. (C1012).
16K RAM. Cassette: $6.95.

Let your computer keep tabs on your odd jobs. Input the time you have available and the program will select a job for you to do. You can add or delete jobs from your own personal job jar.

Utilities Engineering
Steel Beam Design
16K RAM. Cassette: $29.

Calculates and displays the required Steel Beam (W-Section) based on input of Span, Load and Loading type.

Timber Beam Design
16K RAM. Cassette: $29.

Program calculates the Section Modulus and chooses timber beam to comply, then checks the Horizontal Shear of the selected Beam and revises if necessary.

Air Conditioning requirements of various types
16K RAM. Cassette: $29.
Program has data on 32 types of Buildings and calculates the Air Conditioning for input of Square Feet of Floor Area.

Bob Woish
Push Processing
2K RAM. Cassette: $3.95; listing: $2.95.

Use any black and white film at any A.S.A. rating. Simply enter manufacturer's A.S.A. number and the A.S.A. used for exposure, and the computer outputs development information.

Zeta Software
Plane Frame
16K RAM. Cassette: $37.45.

An excellent tool for the professional engineer or an example of state-of-the-art matrix structural analysis for students. A typical database can contain 12 joints, 14 spans, and 7 sections.

Ham Radio Pak
16K RAM. Cassette: $24.45.

Special package which includes: 1) POLSAT: Calculates minute-by-minute aim-angles for polar orbiting comsats. 2) GEOSAT: Calculates the aim-angle to any of the geostationary comsats. 3) DISH: Calculates the plotting points for custom radio dishes.

Z-Games
Hamware
1K RAM: $2.

5 programs for ham radio operators. Covering circuit design AC and DC, Impudence, Frequency, and Antenna design.

ZX-Panding, Ltd.
Clocks and Timers
16K RAM. $3.75 plus $1.25 s&h.

Three separate programs in a menu-driven format: 1) Digital clock constantly displaying the time. 2) Count-up timer allowing the user to set the starting time, and 3) count-down timer with a moving visual display after time lapses. Displays military or conventional time.

Your Special Day
1K RAM. $3.75 plus $1.25 s&h.

Good example of using successive equations to answer a practical question. Enter any date in history and the ZX will tell you which day of the week it occurred on.

Anypoint Plotter
1K RAM. $3.75 plus $1.25 s&h.

Crunches any data to allow the best possible graph by readjusting the vertical coordinate to each set of data. A data summary will then follow including lowest and highest data points, data sum, and data mean.

The Economy Trio
1K RAM. $8.75 plus $1.25 s&h.

3 programs available on separate cassettes combined onto one cassette: *Clocks and Timers*, *Your Special Day*, and *Anypoint Plotter*.

Program Collections

Computer-Wear Software
2 Program Advertising Package
16K RAM. Cassette: $25.95 plus $1.50 s&h.

Run your next direct mail/space advertising campaign like Fortune 500 companies with this professional kit. Designed by an Advertising Director, these programs take the guesswork out of production, lists and mailing costs, quotas, risk summaries, P & L DATA BASES, advertising planning, evaluation and analysis.

Custom Electronics Device Corp.
5 Business Programs V.1.0.

Programs include: Business Forecasting: Uses moving average method. Ratio Analysis: Uses current ratio, net profit to sales, investment turnover, earnings on interest, inventory turnover. Break Even Analysis: Uses break down of costs. Try Before You Buy: Calculates monthly cost

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of owning a given item, including interest, upkeep, personal property tax, and other expected expenses.

D.S.B.C.
Programs for the Basic (2K) ZX81/TS1000
2K RAM. Cassette: $6.95.

9 programs designed to show what the basic computer can do. 5 moving graphic games, 4 practical programs. By listing to screen, shows many useful applications of the Basic language. A help for novice programmers.

Gladstone
Business Pac 1 (Z49)
16K RAM. Cassette: $29.95.

2 tapes with an instruction/applications manual and these programs: 1) Break Even Analysis. 2) Cash Flow Analysis. 3) Payback Analysis. 4) Internal Rate of Return. 5) Depreciation Analysis.

Lamo-Lem Laboratories
ZX81 Home Computer Package
1K RAM. Cassette: $9.95.

Four programs: Billboard: Scrolls a giant banner across the screen. Etch-a-Screen: Draws text & graphics in any direction. Checkbook Balancer: Keeps a running tabulation of your balance. Composer: Plays music as you press the keys. Manual, 2 keyboard overlays in color.

ZX80 Business Package
4K ROM; 1K RAM. Cassette: $9.95.

Three programs: Search and Save: Stores and retrieves keyed files on tape. VideoComp4: Manipulates 3 columns of 16 elements; performs integer operations on one element or an entire column. VideoGraph: Produces a bar graph from the VideoComp4 results. Manual, two reference cards, file record sheet, and color keyboard overlay.

ZX80 Home Computer Package
4K ROM; 1K RAM. Cassette: $9.95.

Package of 5 1K programs. Etch-a-Screen: Draws text and graphics. Calculator: Multiplies or divides to ten decimal places. Checkbook Balancer: Keeps a running tabulation of your account. Electronic Billboard: Bounces a message of giant letters across the screen. Music Composer: Plays back over a nearby radio; notes entered on keyboard. Includes keyboard overlays in color and more.

Orbyte Software
Execu-Soft
16K RAM. Cassettes: $128.

7 programs for the small business: Customer Credit File; General Ledger; Execu-Diary; Execu-Address and Phone File; Accounts Payable; Accounts Receivable; Inventory.

R. Panwar
Program 1: ADDR
16K RAM. Cassette: $19.95.

Multipurpose program for home and small business use. Stores and retrieves information by user defined codes. Stores 125 entries. Provides 3 fields of 1, 6, 84 character length; allows search by 1 or 6 characters. Used for lists of names, addresses, phone numbers.

Program 2: ACCR
16K RAM. Cassette: $19.95.

Similar to Program 1, but has 4 fields of 1, 6, 20, and 13 characters (for amount). 215 entries. Search 3 ways. Total for amount column. Many uses.

Simplex Software
Home Pac
16K RAM. Cassette: $19.95 Visa/MC.

20 programs inclding: Biorhythms, Comp-U-Sketch, Invader, Micro-Organ (music), Statistics, Regression, Checkbook Balancer, NPV, CAI, Kaleidoscreen, Animals, Renumber, Machine Language Monitor, Arithmetic Drills, and more. 21 page manual. Price above is for limited introductory offer.

Timeworks, Inc.
5-2K Family Pak. (1308).
16K RAM. Cassette: $14.95.

Five programs for day to day tasks: Memoboard: Serves as family message center. Checkbook Balancer: Simplifies reconciling your check book. Recipe Recorder: Stores up to 60 recipes on a C-60 cassette for easy recall at any time. Mini Money Manager: Helps you plan and track your household budget. Homework Helper: Turns your computer into a tool for math or science homework.

Taxes

Computer-Wear Software
1982 or 83 N. Y. State Tax
16K RAM. Cassette: $11.95 plus $1.50 s&h.

Fully-automatic/completely reliable program does N.Y. State/City taxes in minutes. Includes tax tables; all mathematical computations are done by your computer. Works for every filing status. Contains integral Standard Deduction routines. Pre-order next year's on 11/83.

1983 Federal Tax Forms
16K RAM. Cassette: $11.95 plus $1.50 s&h.

Fully-automatic/completely reliable program does Federal Income Tax Forms. All mathematical computations are done by your computer. Works for every filing status. Contains several schedule forms. Information and pre-ordering next year's after 11/83.

Ksoft
Tax Return Helper. 1982 ed.
16K RAM. Cassette: $14.

Set of 7 programs for Form 1040 and Schedules A, B, C, C1/C2, D, and E. Data is interactively entered/examined/modified and the results can be seen immediately. Performs all computations and even detects some errors. As in an electronic spread sheet, changes update all lines affected. Forms can be printed and/or saved on tape. Cost is deductible. ($7 for buyers of the 1981 edition.)

Orbyte Software
Income Taxes
16K RAM. Cassette: $16.95.

Income taxes contains all information necessary to guide you through the IRS forms. Step-by-step instructions. Does the mathematical calculations. Continuous updates allow the program to be used year after year.

Software Lab East
The Tax Helper Series
16K RAM.

The tax helper series uses artificial intelligence to assist the user to prepare common personal and small business tax forms. The programs ask the user questions and tell which amounts should be placed on each line of the tax form.

Thomas B. Woods
Sort
1K RAM. Listing: $3.

ZX/TS collating tool. Count and file 1000s of items in up to 29 categories with just 1K RAM. Listing and text provides an indepth review of Basic programming techniques. An instructional aid to beginning computerists as well as a useful home and office tool.

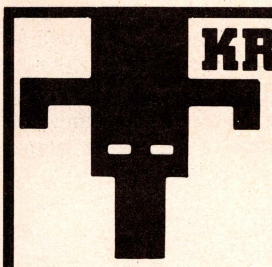
Address and Phone Lists

American Micro Products, Inc.
Address Book
16K RAM. Cassette: $17.95.

Allows the user tp create a database of up to fifty names, addresses, and telephone numbers. Search the database using names, telephone numbers, and zip codes as the search criteria.

Basco
Address File/Mailing List
16K RAM. Cassette: $10.

Menu driven program allows name, address, and 2 lines of misc. information. The file can be searched using any piece of known information. Name and address only can be sent to ZX printer



KROK Better than Pac-Man. Split screen, split-second timing, action adventure. Left portion of screen shows your progress through a complex maze, pursued by relentless crocodiles; upper right portion shows details in each room. Encounters with graphic spiders, snakes, bats, monkeys. Find treasure, coins, keys, ring, code. Engage in kill-or-be-killed struggles. Open locked cellar door for more hazardous subterranean adventure. 16K. $8.95/2K. $6.95.

STAR SEARCH Graphic space saga among the stars. Shoot down flying saucers, explore unknown worlds, locate and solve mystery of deserted ghost ship. Reach for the stars in a world of dazzling space created by inverted graphics. Move with machine language speed. Fast action saucer shoots require precise timing. 16K. $8.95.

NOAH'S ARK Ultimate nonviolent computer hide-and-seek game. Help Noah find 52 animals hiding in more than 7000 bytes (10 full screens) of continuous graphics. Different every time. Highlights include flowing river, "intelligent" animals, race against the coming flood. Great for children, adults. 16K. $8.95.

CRYPTO-WHAMMER Use this program to solve cryptograms, break codes. Displays original code at top of screen, changes as code is broken below. 16K. $6.95/2K. $5.95.

CROSSWORD-PUZZLER End erasures, smudges. Display and solve crossword puzzles on your TV screen. Easy to use. 16K. $6.95/2K. $5.95.

POINT-SPREADER 83 The best — available July 1 in time for NFL '83. More than 20 years NFL experience packed into this point-spread computing program. Factors in injuries, weather, field, rivalries. Updated after every game. 16K. $9.95.

CROSS-REFERENCER Stay on top of libraries, magazines, record collections. Cross-reference material by subject(s), title, date, author/artist, etc. Splits to create multiple programs as material grows. 16K. $7.95.

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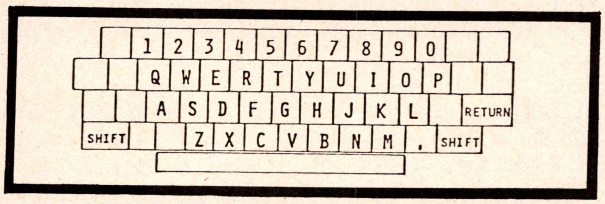
Distributor/retailer inquiries welcome

KEYBOARDS



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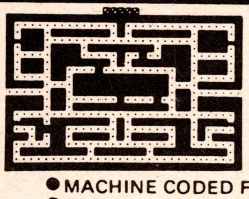
SF GOBBLERS

PUCKMAN FOR 16K ZX81



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Now press "W" and the cursor becomes a **writing** cursor allowing you to write directly into memory in either hex, decimal or character form.

Press "C" again to exit cursor mode and you are free again to move your **memory scope** using the 4 arrow keys to rapidly sweep your view anywhere in memory.

Program Uses:

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and can be used to address envelopes. Ideal for home, clubs and small business mailings, telephone lists, Christmas cards, Customer lists, etc.

CRC Software
Little Black Book
16K RAM. Cassette: $9.95.

This program is the electronic name, address, and phone number software that turns your computer into a mailing list or instant name, address, and phone number retrieval system. Saves data on tape for permanent use.

Executive Workshop
Customer/Supplier File
16K RAM. $4.95.

Keeps track of 100 customers or suppliers, their phone numbers and two 18 character product code (or other) listings. Includes add or delete function; change phone number or product code listing.

H & H Electronics
Universal Address List
16K RAM. Cassette: $10.95 plus $1.25.

Menu driven, program includes locations for name, address, telephone, and an extra line for comments. Includes complete editing functions; before, and after entry. Some uses include: Xmas card list, telephone number of files.

Heath Computer Services
Mailing List. (SBG-56838).
16K RAM. Cassette: $9.95.

Holds up to 100 names, addresses, and telephone numbers; search by name, city, zip code, or phone number to find any address or phone number; sorts by name, city, or zip code in alphabetical or numerical order; lists names, changes or deletes; prints list of names or names and addresses or labels.

Mailing List. (SBG-56839).
64K RAM. Cassette: $9.95.

Holds up to 500 names, addresses, and telephone numbers; search by name, city, zip code, or phone number to find any address or phone number, sorts by name, city, or zip code in alphabetical or numerical order: lists names, changes or deletes, prints list of names or names and addresses or labels.

Continued on page 120.

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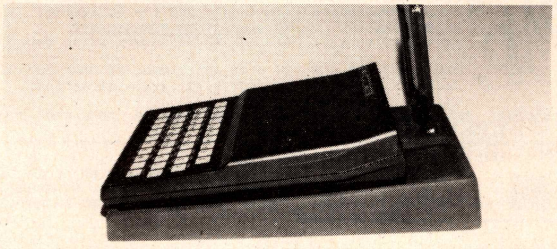

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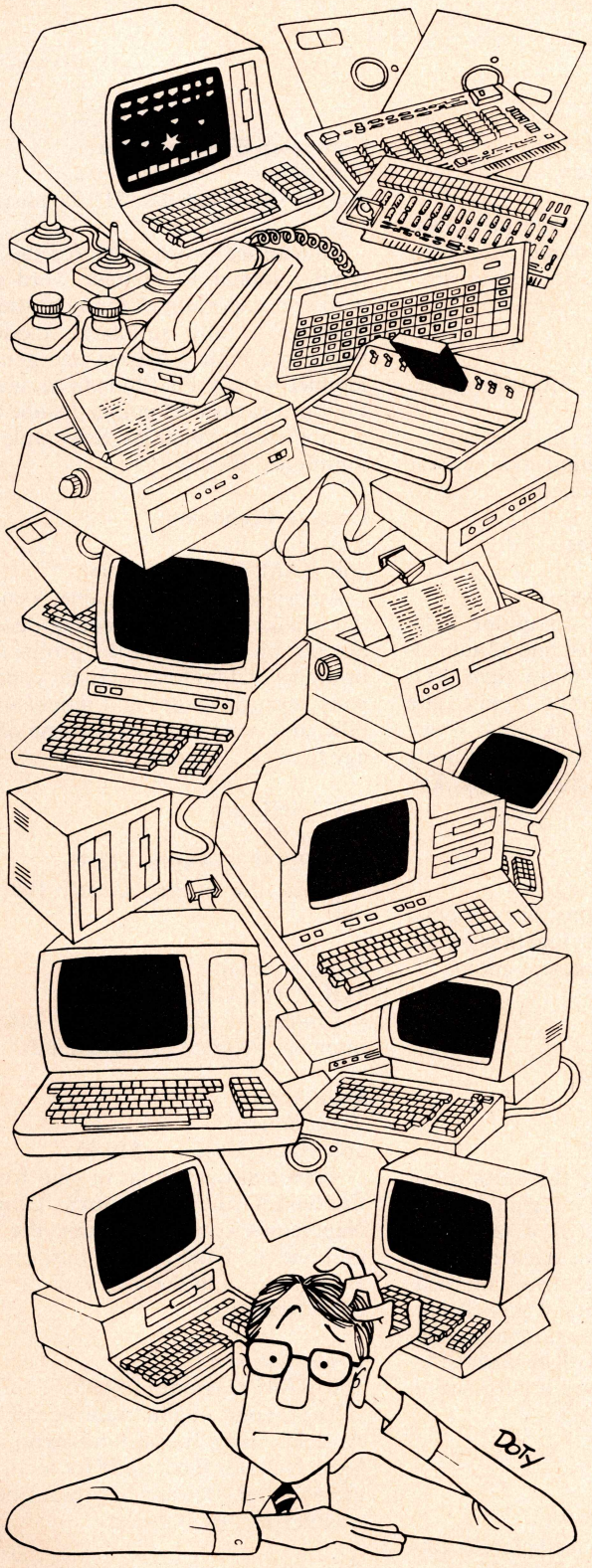

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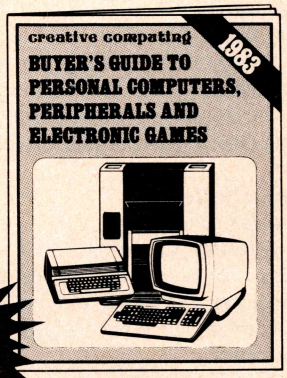

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American Micro Products, Inc.
Island Kingdom
16K RAM. Cassette: $17.95.
You are set on a small island kingdom as a ruler of a hungry group of peasants. You must contend with untrustworthy neighbors, crop failures, industrialization, education, pollution, and an occasional tidal wave.

Andy Longacre, Jr.
Maxwell's Demon
2K RAM. Cassette: $5.
A video action game in which you work against the clock in trying to trap up to 24 bouncing balls (depending upon the level of difficulty selected) in one half of the playing court. Demonstrates certain statistical and thermodynamic principles; offers arcade-like challenges.

Apropos Technology
Wordplay
16K RAM. Cassette: $10 pp.
Five language oriented programs. Jargon: A jargon generator; story writes personal stories using player input. Animal: The popular animal guessing game. Haiku: writes a form of Japanese poetry. Secret: A cipher/decipher program which allows messages to be hidden using keywords. All programs have user configurable menus.

Atto-Soft
ZX-Man
16K RAM. Cassette: $14.95.
Turn your TS1000 into an arcade game machine to play one of the classic games of the decade. All in machine code. Add Atto-Soft's joystick and the fun begins.

Banta Software
Murder in the Ram
16K RAM. Cassette: $6.95.
Up to 6 players. Race against the computer and other players to solve the murder mystery with clues given by the computer.

Bomis Prendin Software
The Great Communicator
2K RAM. Listing: $1.
Try your hand at video ventriloquism. Stage your own press conference with this animated likeness of you-know-who.

Bob Brown
Kong
16K RAM. Cassette: $5. SASE for information.
Leap over barrels and climb ladders to make it to the top. Machine code version of the popular arcade game.

Brown Cottage Industries
Noah's Ark
16K RAM. Cassette: $8.95.
Ultimate nonviolent computer hide-and-seek game. Noah must find 52 animals that may be hiding in more than 7000 bytes of graphics and bring them to the ark before the flood. Highlights: 4-way scrolling, animals that follow, a flowing river, continuous graphics, single key commands. ML.

Crypto-Whammer
$6.95.
For solving cryptograms. Lists original cryptogram and changes together on the screen. Performs character count.

Bug-Byte Software
House of Gnomes
16K RAM. Cassette: $16.

Dictator
16K RAM. Cassette: $20.
You have just become the 129th president for life of Ritimba, a typical banana republic. The economy is a mess, the people are volatile. You must maintain your popularity with the army, the peasants, and the landowners; if you do not, they will plot against you either assassination or revolution. You will be assisted by the secret police who give a information on the state of the country.

Cleva Computer Ware
Snakebite/Battle
16K RAM. Cassette: $9.95.
Snakebite: Eat the snake before it eats you; variable speed; create your own hazards. Battle: Demanding game of military strategy that can be played by 1 to 4 players.

Computer-Wear Software
Scramble
16K RAM. Cassette: $11.95 plus $1.50 s&h.
Educational word game for the entire family; similar to popular word games with one important difference: the computer is a fully automatic moderator between 2 human players and generates jumbled words. First human to unscramble word earns vital points. Invalid words do not count. Penalties. Selectable game duration/difficulty.

Cottage Technology
You're the Boss
16K RAM. Cassette: $9.95.
A business simulation game. You make the production and marketing decisions. For fast growth, invest the profits in new products and factories. Guide your company through booms and recessions, pitfalls, and opportunities. A game of strategy for 1 or 2 players.

CRC Software
Panzer SS
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Shoot the enemy tanks!! But, look out . . .

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Children learn to identify letter and numbers. A great preschool aid.

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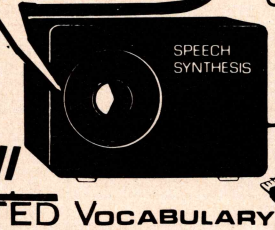

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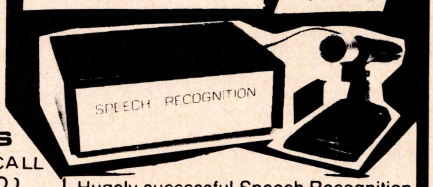

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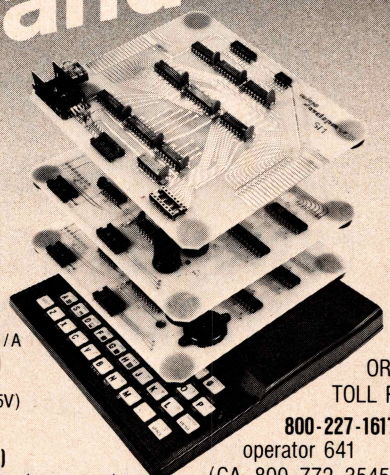

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micro developments

Games, continued...

43 memory locations must be PEEKed and POKEd to make progress. On LOADing the program, you find that it has been overtaken by the Mad Programmer. You must trap him in a location from which there is no escape. By Newsoft.

Airline
16K RAM. Cassette: $14.95.

Object: to make enough profit to take over British Airways. Decide on number of aircraft to operate, to buy or charter, level of staffing and maintenance, whether to have longterm fuel contracts and whether to repay loans. Problems encountered: strikes, cancelled flights, hijacks, and aircraft crashes. Uses histograms, bar charts, and graphics to simulate the information available.

Dallas
16K RAM. Cassette: $14.95.

Object: to make enough profit to take over Euing Associates. A map of Texas shown splitting the region into hundreds of plots each with a potential to discover oil. Make seismic surveys, bid for concessions, drill for oil, build production facilities and lay pipelines. Direct your corporation along many diverse routes. Menu driven.

Autochef
16K RAM. Cassette: $14.95.

Object: to make enough profit to take over Trust House Forte in the shortest possible time. From information supplied decide on which type of outlet to operate, the price of the menu, whether to enter into loan contracts or purchase consignments of food or wines and the level of advertising, wages, and dividends. Decisions influenced by levels of inflation.

Print Shop
16K RAM. Cassette: $14.95.

For managers interested in testing their business acumen. The game spans a period of 12 weeks and each week the player must make decisions on the number and category of staff to employ, amount and type of paper to purchase, the quotation for each job, and the scheduling of work to the optimum week.

TS/ZX Pac Man
16K RAM. $19.95.

Fantastic recreation of the famous arcade game. Fast moving, several degrees of difficulty depending on your skill.

Emvee Software
Mini-Manufacturing
16K RAM. Listing: $6.

Compete against another player or the computer to manufacture a set of 5 orders for 3 different product types (produced by being sequentially processed through 3 separate machines). Random events (e.g., strikes) can disrupt your planned production schedule. Variable program parameters give vast permutations of game challenges. Full instructions.

D. Ernst
Cave of Destiny (001) $10.

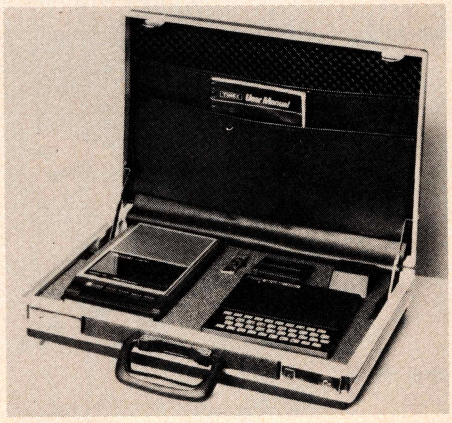
Plays like many of the popular role playing games except that the computer is the game administrator. Includes instruction booklet and dice.

Florida Creations-Dept. SBG
Madame Ruby Package
16K RAM. Listing: $5.

Artificial intelligence simulation. Ask her anything. She examines your question and gives you an answer which makes it seem like she understands you.

Friendly Computer
Strip Poker
16K RAM. Cassette: $9.95.

The traditional game, improved and computerized. For 2 or more players. The computer deals the cards, records the bets, announces the winner, guides the players through the game, and does all record-keeping. Strip Poker can be used by anyone.



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P. Hargrave
ZX Froggie
16K RAM. Cassette: $14.50.

Froggie must cross the busy highway and hop from log to log to get home. Featuring: full screen moving graphics; fast machine code action; four levels with different screens and increasing speed. Name best scores and SAVE for the next time. Arcade Type.

Gladstone
Concentration/Word Challenge/Number Challenge (Z58)
16K RAM. Cassette: $14.95.

3 games: Concentration: 3 ways to play; match numbers, shapes, or patterns with a friend or the computer. Word Challenge: Modelled after the famous word game Boggle; up to 6 players. Number Challenge: How many numbers can you recall . . . backwards? 3 levels; up to 6 players against the computer.

Marine Rescue (Z96)
16K RAM. Cassette: $9.95.

Your ZX81 is the command console as a diver descends to the sunken submarine the Nautilus to rescue as many of the stranded crew as possible. It is a race against time as you oxygen supply must be replenished and a constant battle against marauding sharks which you can attempt to blast with your laser.

Around Europe in 80 Hours (Z82)
16K RAM. Cassette: $11.95.

You are in your club in London, where you have just had a blazing row with Sir Roger Partington-Smythe and accepted a wager of $20,000 against your traveling around Western Europe and obtaining a souvenir from the capital cities within 80 hours.

Pop Star (Z84)
16K RAM. Cassette: $9.95.

A question and answer game simulating the exciting world of popular music. Will you make it big and become a star, or go broke?

Inheritance (Z77)
16K RAM. Cassette: $11.95.

Your great uncle is planning to leave his entire estate to you, but first you must prove your financial acumen. If you succeed in this first challenge, you will be invited to load part B where greater opportunities for riches await.

Run the Country (Z77)
16K RAM. Cassette: $11.95.

A game of political and financial (mis)management in which you are running the country. Set policies. See how your tax changes affect the economy. Will your reforms improve things? How will your budget grapple with inflation and unemployment? What about foreign exchange rates? Are these things really within your control? Can you manage to get reelected?

Glassware-D. Glass
Goldmine
16K RAM. Cassette: $4.95. +75¢ S&h.

A challenging, full-screen graphics game, with on-screen instructions and prompts. You (the miner) move into the mineshaft, collecting gold pieces. Blast away rocks to get more, but watch out for cave-ins above! Blast your way back out to cash in part of your gold for more dynamite, and put the rest in the bank.

Spider Case
16K RAM. Cassette: $6.95 + 75¢ s&h.

An action graphics game with seven full-screen rooms. You must move safely through each room, avoiding trained spiders and the webs they leave. Your next room will have one more spider and one fewer escape door than the one you are in now. Escape all the spiders and webs through all seven rooms to win.

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Games, continued...

Graphicomp
Breakout
16K RAM. Cassette: $14.95.
Classic paddle/wall game, includes seven bat angles to increase difficulty. Supports Mikro-graph Joystick.

Frog
16K RAM. Cassette: $14.95.
An amusing test of skill. The goal is to get across the river by jumping from log to log without misshap. Supports Mikrograph Joystick. By Mikrogen.

Haymarket Software
For Adults Only
16K RAM. Cassette: $19.95.
After conducting private interviews with you and your lover, the computer will select a sexual scenario (from over one hundred) that fits your combined moods. This one is so large it was actually written in three parts. Though definitely not for children, this program can be educational as well as a lot of fun.

ZX-Black Hole
16K RAM. Cassette: $10.95.
The object of this board game is to locate a number of atoms hidden on an 8 x 8 board by observing the reactions of laser beams fired into the box. Both the board and all the rays are displayed at all times.

ZX-Concentration
16K RAM. Cassette: $8.95.
The object here is to find more of the 18 pairs of letters hidden on an 8 x 8 board by observing the reactions of laser beams fired into the box. Both the board and all the rays are displayed at all times.

Flip-Flop
16K RAM. Cassette: $10.95.
Outsmart your opponent or the computer to win. The object is to get four pieces of the right color in a row. The problem is that the space a piece is on determines the color. There are 5 levels of difficulty.

Hensley and Associates
Flight Simulator
16K RAM. Cassette: $10.
A real-time flight simulation program for all armchair pilots: aircraft control, instrument reading, flight path viewing, and close encounters with flight hazards. Includes a "pilot rating" scoring system to measure your skills in handling these controls.

Flight Simulation/Airline Management Game
16K RAM. Cassette: $10.
The ultimate in an exciting, educational, and edge-of-seat game for all ages. Experience the tremendous real-time graphics capability of your computer. You are faced with one crisis and decision after another concerning the survival of your aircraft, your airline business, and your passengers.

Hewson Consultants
Nightlite (Flight Simulation)
16K RAM. Cassette: £5.95 in VAT.
You are the pilot of an aircraft with a number of instruments: A/H, artificial horizon. ADF, automation direction finder. VOR, VHF omni directional range. ILS, instrument landing system indicates the line of the ideal glide path and the center line of the runway relative to the aircraft. 10 other instruments.

Pilot (Flight Simulator)
16K RAM. Cassette: £5.95.
Essentially the same as Nightflite, but without the high resolution graphics.

Horizon Simulations
Quest for the Staff of light
16K RAM. Cassette: $9.95.
You must recover a lost Staff to its owner before its too late. This adventure has over 80 rooms and a large vocabulary. Adventure accepts any length command.

Human Engineered Software
Gulper
16K RAM. $15.95.
Arcade style game of chase, capture, and evasion. *Gulp II* has its own unique features, which include no less than 15 selectable game areas (mazes), 9 grades, and 9 speeds.

Just Games
Froggy Hop
16K RAM. Cassette: $9.
Can you help a poor little frog? He wants to go for a swim in the lake. But the lake is on the other side of the road. Would you please help this frog get to the lake?

Kopak Creations, Inc.
Towers of Hanoi
16K RAM. Cassette: $14.95.
An adventure game.

Day at thé Races
16K RAM. Cassette: $14.95.
Pretend you are at the British race track, and win big money.

Pontoon
16K RAM. Cassette: $14.95.
Card Game. Great graphics.

Grand Prix
16K RAM. Cassette: $14.95.
You are driving a fast and easy race car. A nice graphics game.

Enhanced Basic
16K RAM. Cassette: $19.95.
32 page tutorial. Hex-decimal conversion as standard.

Towering Inferno
16K RAM. Cassette: $14.95.
High adventure, danger and fear. You are climbing a high rise tower. A horrible danger threatens the people that live there. It is your job to save them from falling. Good Luck!

Breakout
16K RAM. Cassette: $14.95.
Similar to the arcade game. Written in machine language.

The Flight Simulator
16K RAM. Cassette: $19.95.
Simulates flight in an aircraft. Great graphics game.

Puckman
16K RAM. Cassette: $14.95.
Fast action machine code game. Do not let the ghosts get you. Go for your power capsules; eat those energy dots.

Instant Software
Mountain Pilot (452TS)
16K RAM. $9.95-$19.95.
This is a flight simulation of a mountain pilot. His goal is to bring supplies to a far-off town and return through a treacherous mountain pass. Also gives a realistic air-flight landing simulation.

Integrated Data Systems
Centipede
16K RAM. Cassette: $11.76.
For use with graphics ROM. If you do not destroy the centipede, you have two to fight.

Peckman
16K RAM. Cassette: $11.76.
For use with graphics ROM.

9 Games from Kayde
16K RAM. Each on a cassette: $11.76 each.
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Games from Oasis Software $14.80.
Chess, 3D O's and X's, Code Breaker, Nim

From Ezra Group II
Biorhythms, Graphics Billboard, Improved Slow Pause, Skew-a-Sketch. $1.04 each.
Horse Race, Linear Regression, Dog Race, Random Music, Shootist. $2 each.
Chewter, Character Generator. $2.96 each.

Intercomputer Inc.
Krazy Kong (FG1013)
16K RAM. Cassette: $12.95.
Machine code version of the popular arcade game. Has all the features of the original and is every bit as fast. Try to go up the ladders to save little Jane, and avoid being hit by drums Kong throws at you. The screen changes when you reach Jane. Now crash the support to conquer the Kong and score points as you progress.

Ghost Hunt (FG1014)
16K RAM. Cassette: $12.95.
Gobble your way through a maze of ghosts, power pills, etc. Chomp your candy to keep running; try a power pill to make a meal out of the ghosts. The menu is very fast.

Jeopardy (FG11003)
16K RAM. Cassette: $12.95.
Improve your memory with this game. You are dealt 45 cards, face up, including one wild card. Before seeing the cards, you must pick the number of matched pairs needed to win. You have several seconds to memorize as many matching pairs as you can before the cards are turned over. The object is to equal the score you chose. Your score is displayed at the bottom of the screen.

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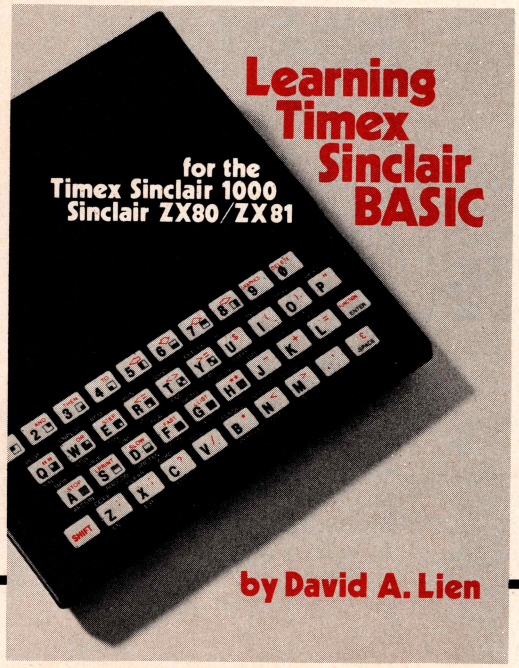

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Games, continued...

Demolisher (FG1005)
16K RAM. Cassette: $12.95.

The object is to demolish a growing wall before it crushes you. Gain points by hitting the correct blocks. Lose points by hitting the wrong ones. This requires a careful strategy. You select the level of difficulty.

Guard the President
16K RAM

The object of the game is to protect the President's life as he speaks to huge crowds on his foreign tour. You control two bodyguards who must detect and eliminate terrorists in the crowd. Your reflexes must be swift in order to preserve the life of the President as well as your own, without hurting innocent people.

Just Games
Horse Race
16K RAM. Cassette: $9.

This horse race game is just like the real thing. First, the players place their bets. Then the track is displayed, and the horses line up at the starting gate. And they are off, the crowds cheer as the horses thunder across the finish line. The betting outcome is then tabulated and the next race announced.

M. C. Lothlorien
Tyrant of Athens
16K RAM. Cassette: $9.95 (ZX81); $11.95 (Spectrum).

As Tyrant of Athens your objective is to overcome opponents, fed your population, and make Athens the most powerful state. Your plan has 2 phases: In the first part of the year you use the money in your treasury to train troops, build warships, and import or export food. In the 2nd part you face attacks by hostile armies/navies.

Roman Empire
16K RAM. Cassette: $9.95 (ZX81); $11.95 (Spectrum).

You are Emperor of Rome in the early days of the Empire. With the legions at your disposal your aim is to conquer all the countries which are hostile to you. Taking account of fighting efficiencies, morale, energy, etc., you will need all your skill to strike the fine balance necessary to win. 3 levels of play.

Peloponnesian War
16K RAM. Cassette: $9.95.

Striking historical accuracy has led to enthusiasm for this exacting wargame set in Ancient Greece. It covers the great war between Athens and Sparta and involves diplomacy, land and naval battles. You use ambassadors, generals, armies and fleets in order to gain allies for the decisive, final pitched battle. 3 levels of play.

Warlord
16K RAM. Cassette: $9.95.

You are a Warlord in 13th Century Japan. You must spend your money to feed your population, build merchant ships, and hire mercenaries. Every year other Warlords attack with armies or Samurai, and pirates (whom you may attack) may capture your ships and cargos. You may send raiding parties to capture gold etc. Retain the support of your village and survive to old age. The alternative is final!

Samurai Warrior
16K RAM. Cassette: $9.95 (ZX81); $11.95 (Spectrum).

You must met the challenges of Samurai opponents, overcome attacks by groups of marauding bandits and assist villages which they may attack. choose your course of action, improve your fighting values, and secure your food supply. Ritual suicide option! 7 levels of play. Objective: exceed points target and either survive to end of game or commit *seppuku*.

The Lamb's Software
Breakout
16K RAM. Cassette: $7.50; Listing: $2.

A game of bouncing balls, walls, and paddles. A choice of three different paddle sizes is provided as well as a choice of paddle movement. An additional variation allows the player to have randomized targets as well as the "breakout walls."

Roadhog
16K RAM. Cassette: $7.50; Listing: $2.

A three-dimensional, night-driving game where your object is to avoid traffic accidents. Cost per mile is continuously calculated. Accidents are caused by running off the road or being struck by another vehicle. The road will turn as you play and oncoming cars are generated at random intervals.

Flips
16K RAM. Cassette: $7.50; Listing: $2.

A two dimensional puzzle type of game with a purpose similar to Rubik's Cube. The player initially chooses difficulty level from which the computer will create the puzzle (new every time). The goal of each game is to change the display to a single video type.

Bactrac
16K RAM. Cassette: $7.50; Listing: $2.

A "Pacman" style game with a "dot eater" and "ghost trackers." 54 initial game setups are possible with choices of playing maze design, energy pills, and dot density. Arrow keys move your man and a running score is kept as well as a best score for this load.

Maranatha
Ahamur

Rule your own island nation. Feed the people, plant and harvest, collect taxes. Can you rule? Or will you starve everyone? 9 skill levels.

Escape

You are trapped. You must avoid the starving Xdroids or guess who will be for dinner. 9 levels from inept to insane.

Marketing

Will you be a millionaire or a bum? The choice is yours. With luck and your choices you can make a million or go to skid row.

Melbourne House Software, Inc.
Wallbusters (26138MY)
1K RAM. Cassette: $14.95.

A game of skill with exciting moving graphics that fits into 1K. Try your skill on the easiest level because even with the most skillful bat control you will find the hardest level a real challenge. Breaking through the first barricade is easy, but do not be fooled. Two ball angles and a curved bat increase the challenge. By Beam Software.

Gamestape No. 2 (13942MY)
16K RAM. Cassette: $14.95.

3 programs. Starfighter: Machine code space battle with twinkling stars and stunning explosions. Pyramid: A strategy game to set you thinking; move the pyramid in stages to the next of 3 bases; one wrong move and it all collapses. Artist: The ultimate aid for graphic designers; lets you use the screen as a sketchpad; then save your drawings. By J. K. Greye.

Gamestape No. 2 (12941MY)
1K RAM. Cassette: $14.95.

11 games ranging from arcade and wordgames to the Wallbusters game. Includes: Klingon, Crash Landing, Simon, Artist, UFO, Code, Asteroids, Bomber, Kaleidoscope, Guillotine, and Breakout. By J. K. Greye.

Reversi (26284MY)
1K RAM. Cassette: $14.95.

A machine code othello playing program. Played on an 8 x 8 board with full screen display; allows only legal moves; choice of starting positions. By Dr. Ian Logan.

10 Exciting Programs (26472MY)
1K RAM. Cassette: $14.95.

10 games: Space favorites: Lunar Lander, Star Trek, Shuttle Pilot, Alien Alert, Space Escape. Arcade games: Shoot Out, Kamikaze Pilot, Battle Zone, Brands Hatch, and Corridors of Death. Includes suggestions for upgrading the games for the TS1000 with additional memory. By Clifford Ramshaw.

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R. Midura
Shipwar
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Graphics display of dice and flashing graphics. 5 rounds to roll the dice and accumulate points. Roll as many times as you wish each round. Double 1's and same roll lose all points for the round. You receive a strike for each single 1 that appears on one of the dice; 3 strikes loses all the points for the round. Pass to next player after rolling at least once during each round. Play against the computer or other human players. The computer will play 1 or all 4 of the players.

Mindware Inc.
From Eagle Sales
Anagrams
16K RAM. Cassette: $15.95 plus s&h.

One by one the computer displays a series of 40 anagrams (up to 12 characters long). To score points, the players have to sort out these randomly mixed up versions of a familiar word or phrase using the clues and promptings of the computer. The user can establish his own anagrams. A delight to crossword puzzle and Scrabble enthusiasts of all ages. By Christopher Jones.

Crossword
16K RAM. Cassette: $15.95 plus s&h.

Crossword puzzle addicts can now design their own puzzles or copy and store favorite crosswords from books and newspapers. Holds puzzle formats up to 15 x 15, along with answers and clues up to 64 characters long. To play, call up any clue you want. When you guess a correct answer, the blank is filled in. By Christopher Jones.

Pilot
16K RAM. Cassette: $19.95 plus s&h.

You are pilot of a small plane facing your instrument panel. Keep an eye on the artificial horizon, radio direction beacons, flight speed, engine rpms, air speed, altitude, runway distance, and fuel gauge. Practice landings, turn, and bank your plane; test your navigational skills. Be careful. You may crash!. If things get too rough, switch on the autopilot. By Hewson Consultants.

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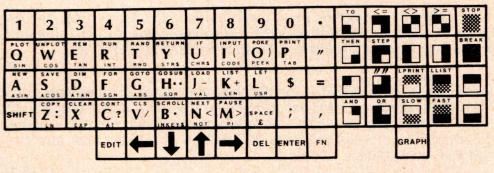

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Brickbats
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Growing Snake
16/48K Spectrum. Listing: $4 plus large SASE.

Very colorful game. You control the head of the snake with the cursor control key and the rest of his body will follow.

Hungry Animal
16/48K TS2000. Listing: $5 plus large SASE.

Manuever a hungry Centipede along a tunnel without touching the walls while eating as many grubs as possible.

2-Bit Software
Mind vs. Machine
2K RAM. Cassette: $9.95.

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Square. (C3014).
16K RAM. Cassette: $7.95.

This program could replace the cube. It can be played as a solitaire game or contest with your friends. Many levels of play. You can rerun the move using the right answer to see how it would turn out. Scores are printed at the end.

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2K RAM. Cassette: $3; listing: $1.
You must locate and disarm the mine before it goes off.

Day
2K RAM. Cassette: $3; listing: $1.
Enter the date and your computer outputs the day of the week it fell on (or will fall on).

Hi-or-Lo
1K RAM. listing: $0.50.
The classic "guess-my-number" game.

2K Game Pack Special
2K RAM. Cassette: $5.95.
Includes: Compu-Pen, Galaxy, Sink the Sub, Mine Field, Hi-or-Lo, and Day.

Zeta Software
Scout Fighter
16K RAM. Cassette: $17.45.
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Space Games

Abersoft
Invaders
16K RAM. Cassette: $9.95.
Arcade type zap the aliens game.

Brown Cottage Industries
Star Search
16K RAM. Cassette: $8.95.
Space saga among the stars. Shoot down flying saucers, explore unknown worlds, locate and find your way through a ghost ship. Inverted graphics create night-time sky. 4-way scrolling, high speed space travel, saucer shoots, continuous graphics, single key commands. ML.

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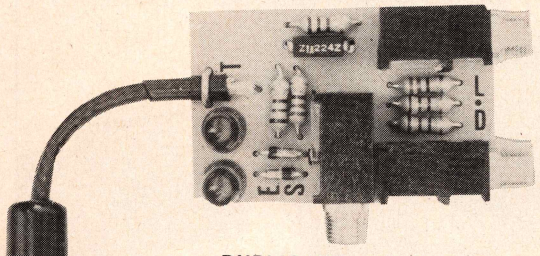

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Calliope Software
Timeblasters
16K RAM. Cassette: $12.95.

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Cleva Computer Ware
Starship Trojan/Princess of Kraal
16K RAM. Cassette: $9.95.

Starship Trojan: Pit your wits against the dangers of outer space and try to save your damaged space craft. Princess of Kraal: Face the monsters hiding in the underground complex to find the treasure and save the princess.

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Startrack: Use graphic photon torpedo attacks to kill off the highly mobile klingons. Fungaloids: Save civilization by bombing the ever-multiplying fungus; beware, it fights back.

Computer-Wear Software
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Galaxy Invaders (Z91)
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Invaders (Z62)
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Invasion Force (Z60)
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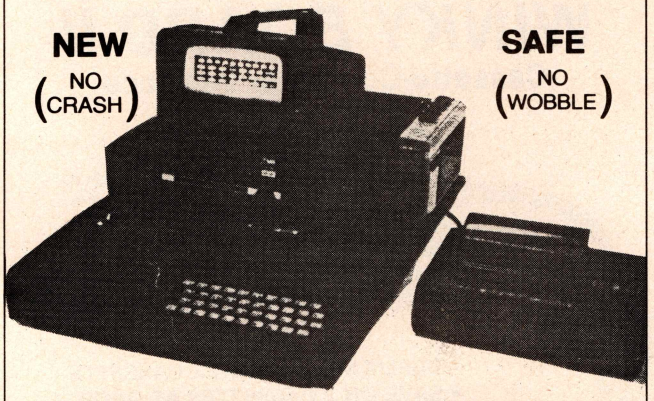

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ZX Scramble (Z90)
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In the style of a medieval joust, 2 mighty robots join battle on a remote barren planet. Your energy shield is being eaten away by Zor's onslaught. Can you think and fire fast enough to save your planet from enslavement?

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You are commander of the *Swordfish,* a subspace striker, the most feared class of attack craft in the galaxy. Your mission is to disrupt the Federation space lanes, to sever their vital supplies. You are likely to be attacked if you miss with your torpedoes, but even if you hit you must watch out.

Graphicomp
Space Asteroids
16K RAM. Cassette: $14.95.
Simulates one of the most popular arcade games around. Supports Mikrograph Joystick. By Mikrogen.

The Invaders
16K RAM. Cassette: $14.95.
Fast machine code program. Features the ability to fire while moving and very fast response to all key pressure. By Abersoft.

ZX 1K Gamespack
1K RAM. Cassette: $14.95.
1K is not dull. Includes: Impact, Target, and Deathray. Does not support joystick. By Mikrogen.

Hewson Consultants
Specvaders
16K ZX Spectrum. Cassette: £4.95.
This is a space invaders type game. Features: 1) 3 lives. 2) Highest score to date. 3) Hall of fame. 4) 5 levels of play. 5) Mother ship and extra aliens. 6) Descending asteroids (this new feature adds extra skill to the game).

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The World of Sangrel (Voyager I)
16K RAM. Cassette: $9.95.
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Adventure to Korvas (Voyager II)
16K RAM. Cassette: $9.95.
Like *the World of Sangrel* but, you have a map display at the top of the screen.

Deathship Sabotage
16K RAM. Cassette: $9.95.
You must stop the deathship before it reaches the earth in this new adventure. This adventure has a large vocabulary and over 80 rooms of ship to explore.

Human Engineered Software
2K Trek
2K RAM. $12.95.
A strategy game in distant galaxies. Command your starship against the Kutar Empire and save the United System.

Integrated Data Systems
Space Invaders
16K RAM. Cassette: $11.76.
For use with the graphics ROM. From Kayde.

Intercomputer Inc.
Return from Space (FG1001)
16K RAM. Cassette: $12.95.
Travel in the mysterious outer galazies and return from space after a long journey. Your fuel supply is limited and you must reach earth and land in the net within 5 rounds. Use the control system of your spaceship to avoid hitting the stars. If a star is hit, you and your ship are destroyed.

Just Games
Appolo
16K RAM. Cassette: $14.95.
Red alert, red alert, enemy missiles approaching base. Man the missile station and blast the enemy out of the sky. Full defensive arsenal at your command.

Crazy Comet
16K RAM. Cassette: $9.
Global defense mission: Code name: Crazy Comet. Cover the major cities of the world. Be on 24-hour alert for enemy planes and anti-aircraft weaponry.

Kopak Creations, Inc.
Alien
16K RAM. Cassette: $14.95.
You are on a space ship hunted by deadly aliens. Will you survive?

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Games, continued...

The Lamb's Software
Armegon
16K RAM. Cassette: $7.50; Listing: $2.

You defend a space fortress against the Zardax invaders. You are permitted the use of up to five laser cannons, each with three shells. Invaders hit at longer ranges give higher scores. Running totals of shots, hits, score, and best score are kept. Invader strategy is selectable.

Star City
16K RAM. Cassette: $7.50; Listing: $2.

As the pilot of an intercolony star cruiser, your mission is to fly through the colonies while logging as many light years as possible. Hindering your progress is the space junk of the colonies jettisoned dynamically into your path. The junk must be avoided by your cruiser or that excursion will be ended.

Maranatha
Rebel Raider

Invade the Empire, defeat several UFOs with hopes of destroying Dark Faker in the Death S Station. 9 skill levels.

Melbourne House Software, Inc.
Combat Flight (14026M)
16K RAM. Cassette: $14.95.

You are the death-defying commander of a sturdy fighter ship, flying through dangerous mountainous terrain, while alien ships are coming after you to destroy you. Even if they do not get you, they may leave behind dangerous flak. You must avoid crashing into the mountains and flying too high. By Grenville Manuel.

Space Trek (26446MY)
16K RAM. Cassette: $14.95.

You are in command of the Starship Endeavor and the Galaxy, made up of 64 sectors, is being invaded by Drakons. Your mission is to seek them out and destroy them before time and fuel run out. 5 skill levels. By Neil Streeter.

Super Invasion (26359MY)
1K RAM. Cassette: $14.95.

Cruel and crafty invaders have been spotted in battle formation ready to attack your ship just below them. You must shift quickly and skillfully from left to right as you return their fire, but be careful because they are accurate. 3 skill levels. By Beam Software.

Gamestape No. 5: 3-D Orbiter (13945MY)
16K RAM. Cassette: $14.95.

You have to save your home planet from the marauding alien spacecraft. Your view screen shows you in 3-D the view out your fighter cockpit window. The background moves when you turn or fly up or down, just as if you were really flying it. But then, you are. The enemy craft will actually zoom towards you and shoot at you if you let them. By J. K. Greye.

Mill Research
ML Raiders
16K RAM. $4.95.

Similar to the game on larger computers, you must line up the approaching ship before he opens fire and then fry him with your lasers. At first one of three different spacecraft comes into view in the distance. As it gets closer it becomes larger and increases in detail, giving a 3-D effect. Machine code.

Mindware Inc.
From Eagle Sales
Cosmos
16K RAM. Cassette: $15.95 plus s&h.

Convoy in distress. As you send your advanced class starship through hyperspace, you learn that vicious aliens are attacking an unarmed space convoy. Use your laser guns to blast at the enemy, but they fight back with space mines that can penetrate your force field. Excellent graphics and fast paced. By Vortex Systems.

Savage Software
Space Trek
16K RAM. Cassette: $14.95.

The enterprising captain of the starship is out to destroy the fleet of klingons. You have limited energy and torpedos for the battle. Energy is used by your shield for protection. Radar scan printout available. The enemy is aggressive, so beware.

The Software House
Voyage Z
16K RAM. Cassette: $6.50.

Guide your craft across the galaxy to save the Bimbos.

Softsync, Inc.
Mothership
16K RAM. Cassette: $16.95.

Simulates 3-D graphics, one or two players option, on screen scoring and plays like no other game you have seen. Drones are pouring down the Zarway, all around you firing deadly lasers. Maneuver to dodge them. Knock off ten and you get a clear shot at the Mothership.

Meteorites
16K RAM. Cassette: $14.95.

Long range scanners pick up a vast belt of asteroids drifting on the fringes of the Star System Nolveg I. Suddenly they are upon you. You dodge, swerve, and fire laser beams at them. On screen: six missles firing in eight directions, wrap around screen. Two sizes of asteroids, scoring and ship count, complete mobility and bonus ship. (Licensed from Quicksilva.)

Red Alert
16K RAM. Cassette: $14.95.

Scramble into your ship, check the computer for status. You have plenty of fuel, bombs, and missiles. Then you are in the air, dodging on-coming aliens, and skimming above menacing mountains. You score points for destroying alien ships, fuel dumps, and enemy missiles. Fast action machine code game of the arcade type; requires agile skills. (Licensed from Quicksilva.)

Softsync, Inc.
Space Commando
16K RAM. Cassette: $14.95.

In this challenging adventure game, the amalgamation of friendly planets has commissioned you to infiltrate Zircon 12, a space colony overtaken by Renegade Androids. You must penetrate the alien security forces and render them defenseless so the Space Fleet can land.

Space Raid/TS Destroyer
2K RAM. Cassette: $14.95.

Two fast moving graphics games, written in Machine Code for the unexpanded TS1000. Available on one cassette. Space Raid: With five laser bases, you fire away at the giant alien spaceship until you hit the alien where it really hurts; 10 levels of play. TS Destroyer: On enemy turf you shoot the enemy warships while avoiding guided missiles and meteors; 30 levels of play.

Software Development Associates
Deep Space
16K RAM. Cassette: $5.95.

You control a space ship whose mission it is to find and destroy enemy invaders within a section of space to which you have been assigned.

THM Software
Z.S.S. Sinclair, Cold Shutdown
16K RAM. Cassette: $12.95 pp.

You are the sole surviving member of the crew of the Zoological Survey Ship Sinclair. You awaken from stasis only to find the alien specimens roaming the ship and a cold shutdown of the ships reactor only hours away! You must fight off the creatures and repair the ship be fore time runs out. 33 pods, unlimited aliens, tools, etc. Screen Display.

Timeworks, Inc.
Scyon's Revenge. (1207).
16K RAM. Cassette: $19.95.

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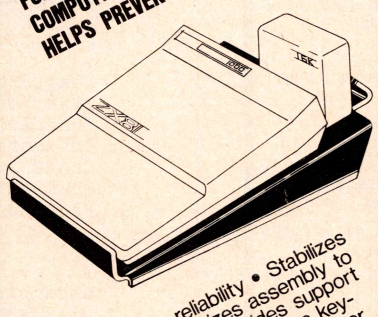

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As captain of the Starship Columbia, you must save Earth from the infamous Scyons. Your ship is equipped with warp and hyper light drive, phasers, and photon torpedoes. Their capabilities are reduced each time your ship is hit by enemy fire. Can you stop the enemy cruiser before the Scyons plunder Earth? Action and thinking game (not just move and shoot) with eight different commands and full graphics.

Michael B. Williams
Z-Trek 1000
16K RAM. Cassette: $9.95.

Battle as many as 200 highly mobile Zylons with your powerful starship, the Sinclair. Full screen display (24 lines) with scrolling and ML routines. 8 commands including 360 degree navigation, probe, and torpedos. Display shows quadrant, status, and galactic map.

Bob Woish
Galaxy
2K RAM. Cassette: $3; listing: $1.

As you zoom through space, a number of galaxies are encountered. You must accurately report the number of stars in each before it disappears in order to succeed. An absolutely addictive graphics game.

ZX-Guaranteed
Space Invaders
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Machine code version of space invaders with on screen scoring, bonus mothership, etc.
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Mazes, Dungeons, Castles

Abersoft
Mazeman
16K RAM. Cassette: $9.95.

Arcade type maze chase game.

Banta Software
Back 'em in Monzxer
16K RAM. Cassette: $6.95.

One player, moving graphics; travel through a maze chomping down dots while avoiding goblins, automatically keeps highest current score.

Supermonzxer
16K RAM. Cassette: $6.95.

Our original adventure game; use information given to you by the computer to travel through a complex cave network killing "Monzxers" and avoiding dangers.

Bob Brown
Maze Man
16K RAM. Cassette: $5. SASE for information.

You are pursued by four ghosts in a maze chase. Score by eating stars and dollar signs. Machine code.

Brown Cottage Industries
Krok
16K RAM. Cassette: $8.95.

Fast action maze game. Intelligent crocodiles (kroks) pursue you through 140 rooms and a 35 room basement in your quest for gold and other treasures, including a sword to kill the kroks. Monkeys, snakes, bats, spiders as well as kroks attack. Single key instant commands; 3 speeds; ML.

Krok 2K
2K RAM. Cassette: $6.95.

Limited version of *Krok* for TS1000 without RAM pack. Includes pursuit by kroks through a maze.

Bronze Star Software
ZT
16K RAM. Cassette: $7.

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at the edge of a thick forest (a randomly generated maze). Seeing only in front, behind, and to both sides, you must avoid the FBI agents who are after you and get ZT home. First in a series of strategy games that challenge the player's mind, not his index finger.

Bug-Byte Software
Mazogs
16K RAM. Cassette: $22.

A maze adventure game with fast moving animated graphics. You must escape the maze with the treasure while fighting off the Mazogs, the creatures who live in the maze and are out to get you. 3 levels of difficulty.

Computer-Wear Software
Maze
16K RAM. Cassette: $11.95 plus $1.50 s&h.

A maze game totally different from other maze games because strategy counts. You are trapped in a series of invisible mazes, each progressively harder. Armed with 3 magic weapons, you must solve each maze before air runs out.

Daw Software
Maze
16K RAM. Cassette: $9.95.

You are trapped in a randomly created maze. By finding and using a large variety of items, you can escape through the secret passage, but be careful of monsters in the maze. An animated screen displays all the action. Each game is a new experience with a new maze.

Dem Co.
16K RAM. Cassette: $9.95.

A 3-D maze game; 4 play options; 9 levels; move count; challenge mode. Prompts with single key entry. Maze generation is random. MC and Basic.

Charles Drury
Marbles, Mazes and Sink Holes
16K RAM. Cassette: $16.

Simple, logical, non-destructive family game simulating hand held mazes. 15 levels each with 4 variations give 60 full-size playing screens; from very easy to extremely difficult. All machine code. Automatic clock and time limit enforcement.

Gladstone
3-D Monster Maze (B78)
16K RAM. Cassette: $14.95.

Find your way through the maze. The exit is there somewhere, but so is T. REX. MC action.

Catacombs (B77)
16K RAM. Cassette: $14.95.

A multilevel graphics adventure game. Each level can have up to 9 rooms, 8 passages, 7 monsters, food, gold, traps, phantoms, and an exit (to the next level). And the number of levels is unlimited.

Gobbleman (Z70)
16K RAM. Cassette: $14.95.

You are being chased in a maze by ghosts. If you can eat some magic food, you have a chance of stopping the ghosts. Personalized high score feature. MC action.

Sword of Peace and Zombies (Z74)
16K RAM. Cassette: $14.95.

Sword of Peace: Free yourself from a dungeon to prove yourself worthy of becoming the Monarch of Oz. Zombies: Stranded on an island, your only hope to avoid the zombies is to lure them into potholes.

Graphicomp
Paint Maze
16K RAM. Cassette: $14.95.

The eat your way through the maze game with a variety of different screens. Your path is painted in behind you to keep track of where you have been. Supports Mikro-graph Joystick. By Mikrogen.

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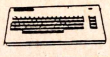

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7. Randomized block k treatment design or two-way analysis of variance without replications (requires equal n in all treatements).
8. Completely randomized factorial J by K design or independent groups two-way analysis of variance (requires equal n in all subgroups).
9. Split-plot factorial J by K design with K the repeated measures factor (requires equal n in all cells).
10. Randomized block factorial J by K design (requires equal n).
11. Completely randomized factorial J by K by L design or independent groups three-way analysis of variance (equal n in all subgroups).
12. Split-plot factorial J by K by L design with L the repeated measures factor (requires equal n in all cells).

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Games, continued...

P. Hargrave
Dragon Hunt
16K RAM. Cassette: $12.50.

A maze game played in Dragon Caves where you must find and slay three fierce dragons with your few arrows, and then try to get out. Dangers include snakes, giant bats, and the ghastly monster. A magic sword will help you if you can find it. Fast decision entry.

Hewson Consultants
Maze Chase
16K and 48K Spectrum. Cassette: £4.95.

A fast arcade style game: You guide a humanoid around a maze. There is food in the maze which the humanoid has to eat and on this the scoring is based. Other items in the maze: 1) Guardians, these move around the maze trying to prevent the humanoid eating the food by eating it. 2) Lemons, these score extra points. 3) Magic strawberries, when the humanoid eats one of these it can attack the guardians and force them back to their cage. The humanoid has three lives per game. Four mazes with the 16K version, and 8 with 48K.

Puckman
16K RAM. Cassette: £5.95.

Puckman is a fast arcade style game. You guide the humanoid around the maze scoring points by eating the food in the maze. 4 guardians controlled by the computer try to prevent the humanoid eating the food by eating him. Magic strawberries are littered around the maze and eating these allows the humanoid to chase and eat the guardians causing them to return to their cell in the middle of the maze.

Human Engineered Software
Sabotage
16K RAM. $14.95.

A maze adventure requiring advanced planning and fast reflexes.

Intercomputer Inc.
Maze Drag Race (FG1015)
16K RAM. Cassette: $12.95.

You are speeding in a racing car through a maze nine times the size of the TV Screen. You can drive in four different directions. Score points as you go, but watch for other attacking cars, oily and icy roads, and rocks in your way.

J.L.K. Software
The Labyrinth of Qazx1
16K RAM. Cassette: $15 U.S.; $18 Can.

Combination graphics-text role playing adventure game. Explore the multilevel dungeon while fighting different monsters and collecting different treasures. Draws a map of what you see. The longer you live, the stronger you get.

Just Games
Frantic
16K RAM. Cassette: $9.

You have entered an unexplored labyrinth where just to touch the electrified walls could prove fatal. You are not alone because Evil Otis and his band of faceless robots are out to destroy you. Your only hope is to blast them first.

The Lamb's Software
Eureka
16K RAM. Cassette: $7.50; Listing: $2.

A graphic hidden-maze style of game where you search for the path to the treasures. Points are awarded for each treasure you reach. A game clock, treasure time, and total points are kept. Difficulty increases as you improve. For each treasure you must choose whether to take a known route or to attempt a new path.

Melbourne House Software, Inc.
Gamestape No. 4: 3D Monster Maze (13944MY)

Can you find your way through the maze? The exit is there somewhere, but then so is T. Rex and it is after you. 3-D

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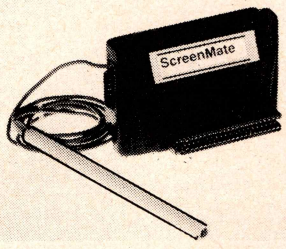

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graphics create the passageways and the movement of T. Rex toward you. By J. K. Greye.

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16K RAM. Cassette: $14.95.

A multi-level graphics adventure that is not limited in its scope. Each level contains up to 9 rooms, 8 passages, monsters, food, gold traps, phantoms. The number of levels is infinite. By J. K. Greye.

Mill Research
Pakguy
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Beware of goblins as you move through this full screen maze, gobbling up dots for points. If you eat a power capsule, you can chomp on the goblins and gain extra points. With three skill levels.

Keltinor's Keep
16K RAM. $6.95.

Dare to challenge this mysterious castle, and you are in for a perilous adventure. The keep is made up randomly of 20 rooms and 2 levels. Various treasures and weapons are in the rooms you search, along with monsters and obstacles which block your way. The computer gives a detailed description of each room and accepts many varied commands.

Mindware Inc.
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Labyrinth
16K RAM. Cassette: $15.95 plus s&h.

Pick your maze; from small and simple to complex. The maze is displayed for a few minutes to let you memorize your way through. Then the maze vanishes and you have to find your way just as if you were stuck in a maze. If you get lost, signal for help and the computer will display the maze plan with your position. When you finish, you get a replay of your route. By Axis 1981.

Gulp
16K RAM. Cassette: $15.95 plus s&h.

Fast paced game of chase and escape. Dash through 5 different mazes; pick up points by gulping food along the way. But you share the maze with the hungry ogre, and he is out to gulp you. The more you eat, the angrier he gets, and the faster he will chase you. Nine speeds and difficulty levels. By Campbell Systems.

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16K RAM. Cassette: $16.95.

On a routine mineral survey of the Planet Spolig you stumble into a mysterious unexplored cave. If your oxygen runs out, you will join the Wizard's bone collection. The Wizard will confront you and give you a word. You must determine if it is spelled correctly or not. When you are right, the Wizard gives you more oxygen, but beware for he has many challenges and obstacles for you. 3-D graphics, 3 skill levels, ages 10/up.

Timeworks, Inc.
Robber of the Lost Tomb. (1203).
16K RAM. Cassette: $14.95.

As a special archeological consultant to the CIA, your mission is to recover four sacred tablets from a lost 100-room tomb in Egypt. Inside the tomb you will be confronted by snakes, ghosts, bottomless pits, and mummies, with only determination and cleverness to make your mission a success. 3-D graphics, ten skill levels. Game can be saved and continued later.

T-S Systems
Escaping the Maze
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Challenge your ability to escape the maze.

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16/48K TS2000. Listing: $6 plus large SASE.

Steer the submarine through a narrow channel with the left and right cursor keys.

Adventure Games

Abersoft
Adventure 1
16K RAM. Cassette: $19.95.

Classic textual adventure with 140 locations & large vocabulary.

Bug-Byte Software
The Damsel and the Beast
16K RAM. Cassette: $15.

An adventure game of concentration and suspense. You wander in the darkness dangers of the beast's palace to find the Damsel hiding or imprisoned there, kill the Beast, get the Damsel out of the palace before she starves to death.

Daw Software
16K RAM. Cassette: $9.95.

A graphically animated adventure game. Test your skill and luck fighting many different kinds of monsters in a crypt. A bandit infested road separates the crypt from the safe town. As you defeat monsters and bandits, you will gain power and confront the more challenging monsters.

Haymarket Software
Ring of the Goddess (pt.1)
16K RAM. Cassette: $12.95.

This adventure game could take you up to 40 hours to complete. You must find the ring of the Goddess, rescue the girl, defeat a witch and keep an evil wizard from getting the ring. There are several problems you must overcome and lots of objects to help you. Over 20 rooms.

Ring of the Goddess (pt.2)
16K RAM. Cassette: $12.95.

Takes over where part 1 left off and contains a whole new set of problems. You must get the ring and the girl to the Temple of Alicia. There is nothing random in this game, every problem has a

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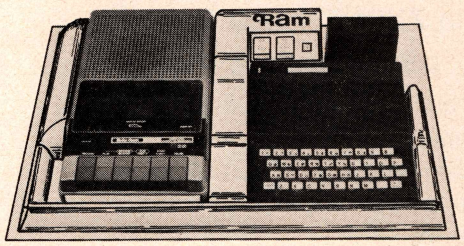

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Espionage Island (Z99)
16K RAM. Cassette: $14.95.

An adventure game. You are flying over an apparently uninhabited island in the South Atlantic and your engine fails. Learn to treat the natives with respect, avoid capture and the enemy, and return with the island secret. Cassette routines available to save and reload at any stage of the game.

The Keys to Gondrun (Z95)
16K RAM. Cassette: $9.95.

A journey beneath the Enchanted Forest in search of the missing keys of Gondrun the Wizard. Can you stay alive and find the keys? Map the caves as you travel through them, but beware of the nasties lurking there. Features real time monster fights at 6 skill levels. Alternate responses give a different game every time. Save games in progress.

Inca Curse (Z80)
16K RAM. Cassette: $14.95.

You are in a South American jungle near an undisturbed Incan temple which has lots of treasure. Your aim is to get out with as much treasure as you can, but do not let greed become your downfall. Cassette routines to save and load the game at any stage.

Trader (P10)
16K RAM. Cassette: $19.95.

Actually 48K long, but is loaded in 3 parts. Variables are passed between programs to provide continuity. Fully animated illustrations.

Krakit (Z48)
16K RAM. Cassette: $19.95.

An adventure game and treasure hunt. Be the first to crack the puzzle and the $20,000 prize *which actually exists* will be yours. Only one prize will be awarded. You have 12 clues. The answer to each is the name of a country, a city or town, and a number.

Graphicomp
Adventure 1
16K RAM. Cassette: $16.95.

A full machine code adventure game. A truly addictive game of dungeons and dragons variety. Wander the caves and find the treasure, but beware the snakes and dragons. Very close to original mainframe version. By Abersoft.

Pimania
16K RAM. Cassette: $16.95.

Adventure game in which the game provides riddles which if answered correctly will lead you to the time and place where a $12,000 piece of art is awarded you. The reverse side includes a "free hit single" by Clair Sinclive and the Pi Men. By Automta Cartography.

Stormer
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Moviedrome-Video
The Tomb of Dracula
16K RAM. Cassette: $15.

A horror adventure game with 3-D graphics. Price includes air mail postage from U.K. 48K Spectrum version also available; color & sound (also $15).

Pinnacle Software
Raider of the Ancient Tombs.
16K RAM. Cassette: $12.95.

You are a courageous archeologist searching for treasures in darkest Africa. Watch out for the Mogumba Warriors, ancient booby traps . . . and your despicable rival, Merrick. Features combined graphics/text display, eight levels of difficulty, complete instructions in program. Also includes a second deluxe version, with twice as many locations, and an evil demon who relentlessly tracks you through the maze.

Savage Software
Trader Jack
16K RAM. Cassette: $14.95.

Adventure, trading game set in the South Pacific. With 40K pick and outfit your vessel then trade among the islands. Your choice of motor or sail against the storms and volcanic eruptions. A short voyage, low profits; a long voyage with greater risks yields greater profits.

Simpson Software
ZX81 Adventure
16K RAM. Cassette: £4.00.

Adventure game set in Camelot Castle. 25 locations with lots of treasure but watch out for the dwarves and pirates.

Smartware
James Bond Adventure #1
16K RAM. Cassette: $9.95.

You help "Agent 007" make the right decisions to complete his mission. Of course, you will travel to exotic places, fight against overwhelming odds, and hopefully save the world.

Soft-Way
Game Master
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Softsync, Inc.
Double Feature Adventures
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Two adventures on one cassette featuring randomly generated clues, solutions, objects, and rooms so that every time you play the games will be different. In Quest for The Holy Grail you land on a lush volcanic island and must outwit the evil Le Mechant, escape the hungry natives, and descend the underground passageways. In the Elusive Mr. Big you are a hardbitten detective moving against the clock to find the Elusive Mr. Big.

Shark Treasure
16K RAM. Cassette: $14.95.

This adventure takes place in deadly shark infested waters which guard fabulous riches hidden in the wreck of a sunken pirate ship. You must find the treasure and escape unscathed from the jaws of death. The program gives you a description of where you are and what you see. You tell the computer what to do.

Upstate Labs
Dry Gulch
16K RAM. Cassette: $9.95.

An interactive adventure game in which you type in short English phrases, such as GO NORTH, TAKE THE HAMMER, SAW THE IRON BARS, to explore a ghost town in the old west and to search for treasure. In Basic and SAVEable in progress. Estimated time to solve: 10-12 hrs.

Morloc Castle
16K RAM. Cassette: $12.95.

You must find and enter a secret castle, locate a magic medallion (defeating the wizard in the process), and escape with your life. Provides over 200 words of vocabulary. In ML for faster response

and is SAVEable in progress. Uses almost every byte of RAM. Estimated time to solve: 30-50 hrs.

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Submarine Game
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You are the Submarine itself and must destroy a destroyer flotilla by using two right/left cursor keys move your Submarine. The higher scores you obtain, the more pleasure you will surely feel.

Digital Integration
Night Gunner (ZX81)
16K RAM. Cassette: £$4.95.

Enemy aircraft approaching. Battlestations! Waves of enemy fighters swooping in for the attack! Can you survive another mission? This is the ultimate challenge. An entertaining machine code game with excellent graphics. (Distributed under license by Softsync, Inc.)

Gladstone
Battleship (Z56)
16K RAM. $9.95.

The classic confrontation between two naval forces. Position your battleships, cruisers, destroyers, and subs; then search out your opponent's fleet. Keep your forces hidden while trying to sink the enemy's.

Gunfighter (Z76)
16K RAM. Cassette: $11.95.

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Just Games
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Fire up the engines and take off. Maneuver your helicopter through the treacherous cavern all the way to the enemy base. Dodge the enemies ever constant tank fire, missiles, and other obstacles. The rough terrain of the cavern is enough to challenge even an experienced chopper pilot.

Mission: Escape
16K RAM. Cassette: $14.95.

The orders are in: you must launch your fighter and escape from the inevitable. Destroy enemy scout fighters while protecting your evacuation fleet. Your ship has a limited fuel supply and must be refueled often by any possible means. This is the first part of the Mission: Escape real time graphic adventure series.

The Lamb's Software
Subsearch
16K RAM. Cassette: $7.50; Listing: $2.

A naval defense game in which you are the surface vessel. Play choices are "Attack Level," "Ocean Depth," and "Visibility." An enemy submarine and aircraft are attacking you with torpedoes and bombs. You fight back with depth charges and antiaircraft guns.

Orbyte Software
Salvo
16K RAM. Cassette: $14.95.

A game of strategic naval warfare for 2 players. Each has a fleet of battleships, destroyers, and cruisers concealed in the waters of the computer screen. They take turns firing salvos of 7 shots on a coordinate grid in hopes of sinking the opponent's ships. The more ships sunk, the less ammunition available to retaliate with.

Intercomputer Inc.
Missile Launcher (FG1002)
16K RAM. Cassette: $12.95.

Your goal is to destroy the enemy's ammunition, which is stored in five different locations. You have 15 missiles to launch at these targets, and two bonus points for totally destroying it. The destructive power of your missiles increases after each firing. Perfect score is 25.

Air Attack (FG1006)
16K RAM. Cassette: $12.95.

You are a bomber pilot in command three bombers. You are attacked by the battleship and a hidden missile launcher in the port city. Your only chance of survival is to destroy the battleship and city. You lose when all three of your bombers are destroyed.

Submarine (FG1-15)
16K RAM. Cassette: $12.95.

Take the challenge of being the commanding officer of the U.S.S. Subfinder. Intelligence has reported 5 enemy subs are off our coast. Track them down with your sonar which you can use 3 times for each sub. Try to hit the sub with one of your 10 mines, but once you drop a mine they will know your location and will fire torpedoes.

Savage Software
Winged Avenger
16K RAM. Cassette: $14.95.

A fast action game with 6 skill levels.

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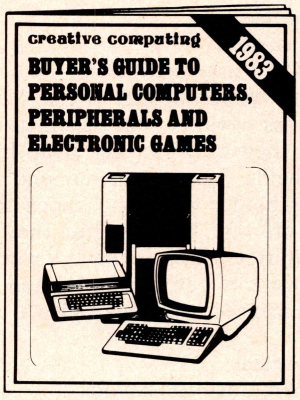

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Softsync, Inc.
Alien Invasion
16K RAM. Cassette: $14.95.

A dark cloud appears on the horizon and inches towards you. The invasion is on and they fire, blowing away bits of your shields. You thrust left and right, avoiding bombs while you knock the invaders off one by one. But they inch closer, thirteen rows, seven to a row. Can you get them before they reach your base? (Licensed from Quicksilva.)

Night Gunner
16K RAM. Cassette: $14.95.

You peer into the inky black sky from your position as tail gunner in a bomber plane, searching for enemy aircraft. A fighter plane swoops down, you swing your gun into position, line up your sights and fire. Each round gets faster and harder. Features on-screen scoring, high score and ammunition count as well as bonus points. (Licensed from Digital Integration.)

Softwar
Guadalcanal
16K RAM. Cassette: $9.95.

You are the commander of a submarine which encounters an enemy convoy. Your mission is to eliminate the entire fleet. Ten commands help you control your torpedoes, missiles, and sabotage missions, They counter-attack with depth charges, mines, and escort boats.

Bob Woish
Sink the Sub
2K RAM. Cassette: $3; listing: $2.

The enemy sub is cruising in one of 10,000 possible locations in the ZX Sea. Your mission is to follow directional clues, track down the sub, and blow it out of the ocean. Compete against yourself or others for best score. Graphics.

Thomas B. Woods
Mad Dog Tank Blaster
16K RAM. Listing: $6.95.

Puts you against the tank. Move your man, plant your mines, but watch out for that tank. It shoots and might run you down. Manual explains moving men, bullets, and explosions. Learn to map your display for complex interactive graphics.

Casino Games

Banta Software
Jackpot Casino
16K or 2K RAM. Cassette: $6.95.

7 casino-type games: Roulette, Craps, Blackjack, One-armed bandit, Horserace, Acey-ducey, and 5 Card draw. 2K Jackpot: as above with 6 games.

Bronder Ent
Craps
16K RAM. Cassette: $11.95.

A craps game that teaches programming skills. Complete listing; fully documented with rem statements and line by line explanation of the program; bound in 3-hole binder.

Slot Machine
16K RAM. Cassette: $7.95.

Changing symbols give a sense of spinning wheels. Over 100 word vocabulary; 24 moving random comment statements. Excellent graphics. Program on cassette and listable; includes printout of odds chart.

Data-Assette
Roulette
16K RAM. Cassette: $14.95.

Accepts all legal roulette bets in any

ARE YOU HAVING PROBLEMS UNDERSTANDING THE MANUAL?

No problem. Understanding Sinclair Basic is a newly developed learning aid which displays and demonstrates 68 Sinclair Basic commands. Basic program lines are displayed and simultaneously run on a split screen. Go as fast or slow as you like because the program waits at each line for your cue to continue. Repeat each program as often as you like by pressing a key. Written in machine language and basic, Understanding Sinclair Basic gives you a powerful tool with which you can unlock the mysteries of Basic programming. 16K required.

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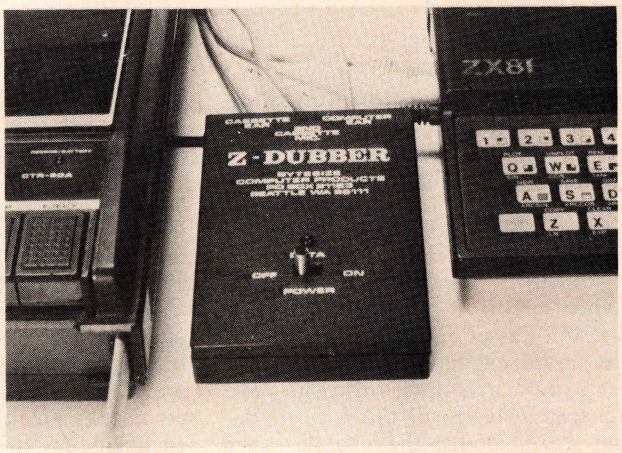

The Z-Dubber also allows you to connect two tape recorders together, to create perfect duplicates of your favorite cassette programs. The Z-Dubber can be yours for $31.95 postage paid within the U.S. area. Money back guarantee if not satisfied. Visa & Mastercard welcome.

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combination from one or two players, both playing against the TS1000 banker. Bet single, double, triple, or quadruple number combinations. High, low; red, black; even, odd; left, right; or middle columns of 12 numbers. By Newsoft.

Florida Creations-Dept. SBG
Las Vegas Package
16K RAM. Listing: $3.

Vegas 21 Blackjack: Plays Blackjack just like Vegas. Double Down, Split Pars, etc. Lucky 7 Slot Machine: Fully animated three reeled slot.

Gladstone
Blackjack (Z88)
16K RAM. Cassette: $9.95.

As it is played in the casinos in Nevada. Up to 5 players against a dealer. 52 cards. Split pairs, double down, and even buy insurance. Deck is reshuffled only when needed; allows for continuous game. Winnings and losings displayed after each hand.

Slots (Z89)
16K RAM. Cassette: $9.95.

Beat the "one arm bandits." Choose 5, 10, 25, or 50 cent slots, even $1. Each machine has 6 sets of different graphics and pays according to the number of coins you have played.

Instant Software
16K RAM. $9.95-$19.95.

This program allows you to improve your blackjack skills. It can accommodate up to seven players against the house, keeps track of all wins and losses, teaches the skill of card counting and shows you how the cards fall in a well-shuffled deck.

Intercomputer Inc.
Vegas (FG1004)
16K RAM. Cassette: $12.95.

The roulette wheel is played by one or two players. Select a number from 1-32 and place a bet (maximum $1000). The payoff is 20 to 1 for a correct number, and 2 to 1 for a number in the same row as the winner.

The slot machine takes $1 bets. The jackpot pays $25, aand two of a kind pays $2. The $ sign is wild.

J.L.K. Software
Slot
4K RAM. Cassette: $3 U.S.; $4 Can.

Graphics simulation of a slot machine. Press any key to pull the handle and watch cherries, lemons, watermelons, oranges, bells, and bars appear in the window.

Craps
2K RAM. Cassette: $3 U.S.; $4 Can.

Graphics game in which you bet on the outcome of the dice. 7, 11, or doubles win bet. Displays giant dice.

Kopak Creations, Inc.
The Gambler
16K RAM. Cassette: $14.95.

Match your black Jack skill with this amazing game on the TS1000.

Lamo-Lem Laboratories
A Night in Las Vegas
4K ROM; 1K RAM. Cassette: $9.95.

Four gambling simulations. Roulette: Numbers flash by until a winner is chosen. Blackjack: Played with 4 decks. Craps: With pass line, "hardways," the field, etc. Slot Machine: With reels that click into place one at a time. Manual, guide cards, color layouts, chips, and 3 keyboard overlays in color.

R. Midura
Crazy 8 and Poker 4
16K RAM. Cassette: $10.

2 games. Crazy 8: Displays card in play, 2 keystroke selection of card from deck of 52 to play with options to draw and to peek at computer's hand at any time during game; score keeping. Winner of a hand is dealt to and plays first. Poker 4.

WHO

Has the most programs for the ZX-81/T S -1000?

	Softsync	Sinclair	Zetaware	Intercomputer	ORIGINAL PROGRAMS
Financial	3	5	0	3	**10**
Educational	5	8	8	5	**4**
Games	11	13	11	12	**12**
Misc.	3	3	6	4	**9**
TOTAL	22	29	25	13	**35**

WHO

Has the best prices?

	Softsync	Sinclair	Zetaware	Intercomputer	ORIGINAL PROGRAMS
Avg. Price	$14.95	$11.20	$13.25	$12.95	**$6.00**

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Competitor information taken from recent advertising.
The figures above may or may not be accurate.

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NEW Sinclair Timex 1000

- Calculate odds on HORSE RACES with ANY COMPUTER using **BASIC**.
- SCIENTIFICALLY DERIVED SYSTEM really works. TV Station WLKY of Louisville, Kentucky used this sytem to predict the odds of the 1980 Kentucky Derby. See the Wall Street Journal (June 6, 1980) article on Horse-Handicapping. This system was written and used by computer experts and is now being made available to home computer owners. This method is based on storing data from a large number of races on a high speed, large scale computer. 23 factors taken from the "Daily Racing Form" were then analyzed by the computer to see how they influenced race results. From these 23 factors, ten were found to be the most vital in determining winners. NUMERICAL PROBABILITIES of each of these 10 factors were then computed and this forms the basis of this REVOLUTIONARY NEW PROGRAM.
- SIMPLE TO USE: Obtain "Daily Racing Form" the day before the races and answer the 10 questions about each horse. Run the program and your computer will print out the odds for all horses in each race. COMPUTER POWER gives you the advantage!
- YOU GET: 1) Cassette.
  2) Listing of BASIC program for use with any computer.
  3) Instructions on how to get the needed data from the "Daily Racing Form"
  4) Tips on using the odds generated by the program.
  5) Sample form to simplify entering data for each race.

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Music and Sound

Bi-Pak Semiconductors
Zon X-81
1K RAM. $49.95 incl. airmail postage.

A self-contained sound unit to plug into your computer to give you a whole range of music sound or noise, 8 full octaves; uses 3 channel sound chip. Full instructions and programs supplied. British made.

Compusound
Telesound 84 $19.
Power supply; 3mA derived from computer modulator.

Enables any sound source such as the loudspeaker or sound effects from a home computer to be heard direct through an unmodified TV set. Three snap on connections inside the computer make fitting easy. Telesound 84 measures an incredible 1 x ¾ x ½ inches and comes complete with full fitting instructions. Dealer enquiries welcome.

DCP Microdevelopments Ltd.
DCP Speech Pack. £49.95.

Compact cased unit that plugs onto rear of ZX81 and gives speech output. Built-in vocabulary and simple to use single POKE commands to make it speak. Other word packs can plug in inside and other ZX addons can plug in the expansion port at rear of Speech Pack. Cased and assembled.

Evansoft Associates
Music Theory/Ear Training
2K RAM and 16K RAM. Send SASE for free catalog or $5.95 for sample.

Elementary music theory and ear training programs. Drill and practice, some tutorial, presented as games. Text, graphics, and sound generation are used in separate programs on note recognition, intervals, melodic dictation, etc.

Florida Creations-Dept. SBG
Music/Sounds on the Radio
1K RAM. $5.

This technical article describes how to broadcast sounds and music to a nearby radio using the natural radio interference generated by the Sinclair. No hardware modifications are required. Sample song and weird sounds listings included.

Gladstone
DCP Speech Pack (D80). $99.95.

Adds solid-state speech. Contains all the letters, numbers zero to over a million, and some general words. Uses POKE commands. Plugs into rear of computer and can be used with other accessories. Contains its own speaker, volume control, and external expansion addition. Word Pack ROMs plug into sockets inside to extend the vocabulary.

Horizon Simulations
Music Machine
1K RAM. Cassette: $5.

This program in machine language will play music through your television on your tape recorder. You play music by pressing the notes on the keyboard.

Hurricane Electronics
Arcade Master Sound Module
Assembled and tested: $59.95; kit: $52.95.

A self-contained plug-in module capable of creating almost any sound imaginable, or music in three part harmony. Two TTL I/O ports with mating connectors for Atari joysticks. Other applications: Security/monitor systems, auto. phone dialer, FSK and DTMF encoder, and more. Can be used with printer, 16K RAM pack, and most other modules.

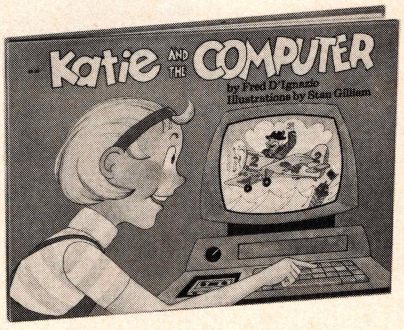
Wm. Maples
Virtuoso
2K RAM min. Cassette: $6.95 pp. ($9.95 outside U.S.).

A versatile music synthesis program. Requires recorder, but no music knowledge.

The computer-age storybook for kids!

KATIE AND THE COMPUTER

By Fred D'Ignazio
Illustrated by Stan Gilliam



This wonderful storybook teaches young children how a microcomputer works. Katie ends up inside her dad's new micro...and has an adventure with Colonel Byte and the other characters who make a computer work. Her journey follows the path of a computer command; her experiences are technically accurate yet easily understandable, right down to her encounters with a program bug. Additional material is included to help you relate the story to actual working parts of the computer. With truly exceptional color illustrations, this is an excellent first computer book for youngsters.
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Program Pack 3. 1K RAM.
3 programs: Astropilot, Automatic Graphic Designer, Roadrace.

Program Pack 4. 16K RAM.
2 programs: Asteroid Belt, Surround (2 versions).

Program Pack 5. 16K RAM.
4 programs: Traps, Sheep, Reaction Timer, Trails.

Program Pack 6. 16K RAM.
2 programs: 3-D Oxo, Mars Rescue (adventure game).

Program Pack 7. 16K RAM.
2 programs: Zombies, Mount Mayhem.

Program Pack 8. 16K RAM.
4 programs written into one 16K program: Word Search, Towers of Hanoi, Germ Warfare, Intercept.

Ken Doggett
5 Games
1K RAM. Listings: 5 Games: $1.95; 8 Games: $2.50.

Game package includes: Starfighter, Sector Attack, and more. Listings are verified for accuracy and on clear readable photocopies.

Florida Creations-Dept. SBG
Arcade Games Package
16K RAM. Listing: $3.

Tank Zap: Tanks appear on the screen and you must get them before they get you. Tic Tac Toe: It is you against the computer in this classic game.

Florida Creations-Dept. SBG
Fun and Games Package
1K RAM. Listing: $2.

Lunar Lander: Try to land on the pad without blowing up. Secret Code: Converts your special messages to unintelligible code and back again. Draw: Draw and sketch on the screen.

Blaine Geddes
6 Programs
16K RAM. Cassette: $11 (Canadian).

6 programs: Checkers, Invaders, Towers, Roadrace, Blackjack, Lunar Lander.

Gladstone
1K Games Pack (Z52)
1K RAM. Cassette: $9.95.

11 games: Slot Machine, Etch and Sketch, Slalom Ski, Catch Me If You Can, Space Pirate, Spacefire (2 versions), Car Crash, Man-Eating Budgies, Maze, and the Wall.

H & H Electronics
Fun & Games
1K or 2K RAM. Cassette: $9.00 plus 75¢ s&h.

12 Game programs that include: Auto Racer, Blackjack, Depth Charge, Display Program, Mini Artist, Three Towers, Russian Roulette, Craps, Atlantic City Slots, and three more.

Human Engineered Software
2K Fun Pack
2K RAM. $14.95.

A real bargain for Timex owners, three arcade type games in one package. Includes Music Maker, Breakout, and Invaders.

Intercomputer Inc.
Combo Pak I (FG1008)
16K RAM. Cassette: $18.95.

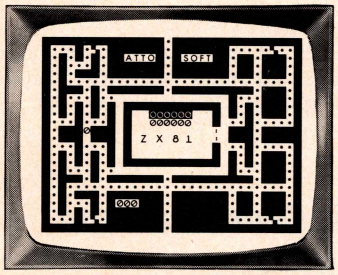
Contains *Return from Space* and *Missile Launcher.*

Combo Pak II (FG1009)
16K RAM. Cassette: $18.95.
Contains *Vegas* and *Jeopardy*

Combo Pak III (FG1010)
16K RAM. Cassette: $18.95.
Contains *Demolisher* and *Air Attack*

Combo Pak IV (FG1012)
16K RAM. Cassette: $18.95.

Contains *Guard the President* and *Submarine.*



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Turn your **ZX81** or **TIMEX SINCLAIR 1000** into an arcade type game computer with **ZX-MAN.** 100% machine code makes this fast acting program as much fun as being at the arcades. With the joystick option you can have the real feel of game playing never before available for your **ZX81** or **TIMEX SINCLAIR 1000. 16K required..... $14.95**

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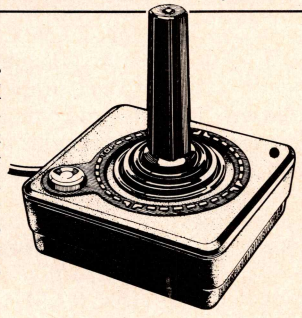

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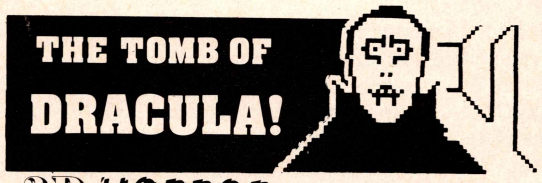

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A superb 3D graphics adventure game! **Enter** Dracula's tomb at 30 minutes to sunset . . . **wander** through the tomb's pre-mapped 300 vaults in search of the fabled Vampire's Treasure . . . **pick up** valuable silver stakes and use them to defend yourself against the lurking horrors . . . ghouls, zombies, pits of primaeval slime . . . **See** them all on the computer's plan of the tomb . . . when it will let you! **Take** a chance on a Mystery Vault . . . if you dare! And all the time the minutes are ticking by to sunset . . . when **Dracula** rises from his coffin and comes after **you!** Each of the infinite levels of the tomb has its own 300 vaults . . . go as deep as you like, the Prince of Darkness will seek you out in his bloodlust! **WARNING: people of an exceptionally nervous disposition should play this game only during the hours of daylight!** Special facility lets you save a game in progress onto tape so you can continue it whenever you choose.

For TS1000/ZX81 with 16K RAM.....$14.95
For TS2000/SPECTRUM with 48K RAM.....$14.95

Price includes ready-to-load cassette with library case and inlay, full instructions, **AIRMAIL** postage and packing. **Order today!** Money refunded if not delighted!

Send cash or cheque to: **FELIX SOFTWARE (DEPT. SCI), 19 Leighton Avenue, Pinner, HA5 3BW, ENGLAND.**

Games, continued...

Macronics Systems Limited
ZX81 Bumper Pack-1
16K RAM. 3 Cassette Pack: £14.95.

Includes 7 machine code/Basic quality games on 3 cassettes (available separately also): 1) Space Invaders and Zac-man (£4.95). 2) Nightmare Park, Space Rescue, and Dragon Maze (£5.95). 3) City Patrol and Sabotage (£5.95).

ZX81 1K Super Trio
1K RAM or more. £4.95.

3 1K RAM machine code games: Breakout, Music Maker, and Space Invaders.

Spectrum Bumper Pack-2
Spectrum. 16K RAM. Cassette: £9.95.

5 games with full color, sound, graphics; supplied on 2 cassettes: 1) Nightmare Park, Space Rescue, and Dragon Maze (£5.95). 2) Devil Birds and Digger (£5.95).

New England Software
7 Game Cassette
16K RAM. Cassette: $14.95 pp.

Mastermind: Up to 6 players can play any difficulty up to 5 out of 9. Doublemind: Challenging. Slot Machine: Correct probabilities and nice graphics. Craps: Nice graphics. Tic Tac Toe: Challenge the computer with 3 levels of play. Sub Rescue: Save the sub. White Hot Number.

Panero Software
Space Challenges
1K RAM. Cassette: $7.25.

Five exciting arcade-action games. All have moving graphics and a full screen display (not cramped in a corner). Includes Defense Wave, Tempestuous Battle, Zap-It!, ICBM Barrage and Lander X.

Earthy Challenges
1K RAM. Cassette: $7.25.

Five arcade-inspired games to challenge and amuse. All have moving graphics and full screen display. Includes Pickle Man, Ms Pickle Man, Supertank Warzone, Monkey Barrels and Mine Field Kaboom.

Challenges from Another Dimension
1K RAM. Cassette: $6.75.

Five arcade-action games with moving graphics and full screen display. Includes Frog-it, Evade, CRON:ZX81 Warrior, Robot Catch and Draw.

Pleasantrees Programming
5 Fun'n'Games Pak
16K RAM. Cassette: $12.95 plus $1.50 s&h.

5 games: 1) 50 States: Teaches states, capitals, spelling. 2) Mini-Boggler: Vocabulary building game (like Scrabble); 2-4 players. 3) History I: Quizzes people, places, dates (1600s 1870s). 4) History II: Like History I (1870s to present). 5) ZXAK-Mamm: Arcade game fun.

Savage Software
Ten Good Games
16K RAM. Cassette: $14.95.

Arcade and maze type. Includes Fstfwd counts for high speed LOADing. Pac Maze, Gobler, Astro Star Defender, Vampires, Suicide, Minefield, Frogler, Dictator, and Bomber.

Simulsion
Classic Games for the ZX81 & TS1000
1K RAM. Cassette: $9.95.

Four games. Lunar Lander: With a readout of altitude, velocity, thrust, and fuel. Dogfight: A get-em-in-your sights action game with 1 second screen updates. Mindmaster: Deduce the hidden combination of four symbols. Life: Form a colony and watch the cells grow or die in two second life cycles.

Softsync, Inc.
2K Games Pack
2K RAM. Cassette: $14.95.

6 great graphically illustrated games on one cassette for the unexpanded TS1000. Copter Patrol: Blow out the enemy defense system. Astrowalk: Reunite with the mothership or else. Killer Whale: Before surfacing for air, the whale must eat as much as possible. Monster Masher: The monster is on the loose. Star Blaster: Blast a path home through the star cluttered galaxy. Dragon Slayer: Escape the hunter.

Software Development Associates
Games Two (G102)
16K RAM. Cassette: $4.95.

Darts: For 1 or 2 players. Throw at a target that has 10, 20, & 30 point zones. Score 200 points to win. Requires 2K. MASTERMIND: Try to guess a secret 4 digit code that is randomly selected by the computer.

Syncware Company
Games I
16K RAM. Cassette: $10.50.
Listing, documentation, and cassette of four games. Syncwars: Keyboard reaction time; in 1K, 2K and 16K. Guess My Number?: Logical deduction. Blackjack: Sheer luck, in 16K only. Listings and docs available separately for $5.00.

2-Bit Software
Games Sampler
2K RAM. Cassette: $9.95.

Contains: Kamikaze Fly: A dexterity game in which Freda the Frog tries to eat dinner. Sketchpad: An easy to use screen drawing program. Navajo Rugs: Generates kaleidoscopic patterns randomly. Biorhythm: Plots your mental, physical, and emotional states on any given day.

Making Treks
2K RAM. Cassette: $9.95.

See the world with variations on adventure games that take you from the calm Pacific to the frosty Himalayas. You may find yourself riding a camel, floating on a hot air balloon, or steaming along on a slow boat to China. The object is to return home before your vacation is over and to have a good time. Bon Voyage. Ages 10 and up.

Mind Bogglers
2K RAM. Cassette: $9.95.

Four brain-testing, brain-twisting trials and triumphs. How good are you at left-brain (analytical) and right-brain (spatial) mental gymnastics. Figure out: Sinclair Towers, Eye Q, Dots and Spots, Seven Bridges. Ages 12 and up.

Timeworks, Inc.
5-2K Games. (1201).
2K RAM. Cassette: $11.95.

Five games for the basic TS1000: Spider Sam: Try to climb the building without falling off. Artist: Draw your own pictures and save them on tape. Labyrinth: Find your way through the maze. Mine Field: Locate the land mines. Galactic Scout: Find your way through the meteors, then battle the enemy to save the galaxy. Full graphics and various skill levels in each game.

Z-Games
Five Games
1K RAM: $2.

5 games: Treasure Hunt, Random Race, etc. Includes aircraft, landing graphics display. Both educational and entertaining.

Other Games on the Computer

American Micro Products, Inc.
Concentration
16K RAM. Cassette: $17.95.

A computerized version of the game Concentration. The game is played on a board containing fifty spaces. The player matches his memory against the computer in finding number pairs hidden across the board.

Banta Software
Football
16K RAM. Cassette: $6.95.

One of two players; stationary graphics: uses statistics to calculate gains and plan strategies. Truly a game for the thinking person.

Cleva Computer Ware
Crazy-cards/Cube
16K RAM. Cassette: $9.95.

Crazy-Cards: Learning the rules does

not seem to help. Totally addictive for cheats. Cube: Use your computer to solve the mysteries of the Rubik Cube.

Dunrobin Software
Rubber Bridge Scorepad
16K RAM. Cassette: $15 (includes airmail postage).

A comprehensive and automatic bridge scorepad. Menu-driven, with statistics page and history of scores each hand (holds up to fifty). All details saveable for continuation/future study.

Dunrobin Software
Brainteasers
16K RAM. Cassette: $15 (includes airmail postage).

Three games: "matchgame" (or "Nim"), "Diceroll," and the old English pub game-"close the box." Frustrating yet absorbing puzzles for any age from 8 to 80. Full instructions included.

Emvee Software
Mini-Cricket
16K RAM. Listing: $6.

Accurately simulates the game of "limited over" cricket. Play against another player or the computer. Input the names of the individual members of your team then decide your team's tactics for each over of the match (whether batting or bowling). Full instructions.

Gladstone
Shell Game[*Number Maze* (Z59)
16K RAM. Cassette: $9.95.

2 games. Shell Game: Watch the "Hustler" move the shells. Try to keep track of the "pea." Bet and guess. Number Maze: Computer version of the pocket puzzle. Move the number squares one space at a time until they are in order.

Glassware-D. Glass
Mastermind
2K RAM. Cassette: $2.95 + 75¢ s&h.

This is a challenging ZX/Timex numerical version of the popular logic game. Can you crack the computer-selected code in less than 10 tries? Full display; prompts and instructions. Check your reasoning power, with only 2K RAM.

Any two games on the same cassette cost $1.00 less than their individual total.

Walter Grundy
Bingo
16K RAM. Listing: $4 and SASE.

Play Bingo; no duplicate numbers.

Hewson Consultants
Backgammon
16K and 48K ZX Spectrum. Cassette: £5.95.

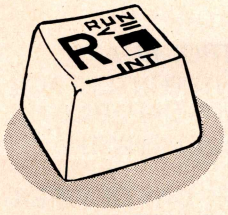
Graphic display of the board, stones and tumbling dice. 8 modes of play. You can choose: 1) A single game. 2) A points series (a number of games are played in succession, the winner being the one with the most points. 3) A gambling series: the computer and you start with £200 each and both put a £10 bet on at the start of a game, which can be increased during play. 4) Watching the demonstration. The game incorporates all the normal rules of backgammon.

Human Engineered Software
Reversi 1000
16K RAM. $15.95.

Now Timex owners can play the popular 19th century parlor game against their computer. Includes multiplayer feature.

Jeu Intelligent
Rubic's Master
16K RAM. Cassette: $15 (orders outside U.S. add $2).

Menu driven program that solves Rubic's Cube step-by-step displaying each move by a simple notation system and a 3-D graphic representation. Features a computer cube scrambler, a current cube saver, and a define cube mode allowing the user to enter any cube.



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Original ZX81 symbols in Red, Blue and Black on White background, covered with 7.5 mils of clear vinyl, and backed with a tough, pressure-sensitive adhesive.

The vinyl overlay is extremely durable, with just enough flexibility to keep the original curve in the key top. When trimmed and sealed per instructions, the edges disappear; the keys look and feel like they were custom-made for your computer. (Caps may be painted any color.)

Includes SHIFT LOCK, an extra FUNCTION/ENTER, and two SHIFT keys in larger sizes, in case you choose to use over-size pads for these functions.

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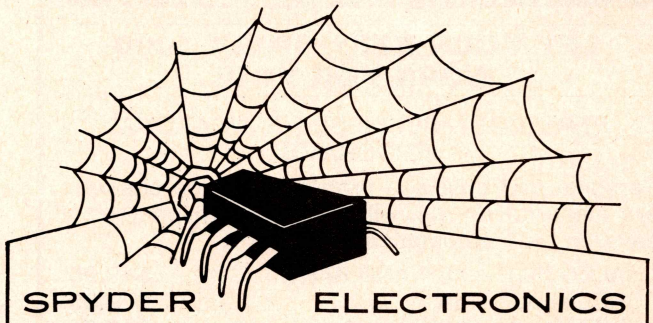
Please add $1.50 for shipping, and include 6% sales tax in California.



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Morgantown, WV 26505

USA funds only

Kopak Creations, Inc.
Backgammon and Dice
16K RAM. Cassette: $14.95.

You will need more than just luck to win this game in machine code. Full featured games include: graphics board, rolling dice, and more.

Mine of Information
ZX Othello
16K RAM. Cassette: $19.

Available for the ZX81 or Spectrum, contains many features accessed through a menu before, during and after any game. Nine skill levels, action replay, set up initial position, sample game, etc. Sold via Sinclair catalog. Market leader in Britain.

P. Nethercot & R. Rackstraw
23 Bricks
5K RAM. Tape only. £2.

A game of mathematical strategy. It starts with 23 bricks and players may take 1, 2, or 3 at a time. The idea is to leave your opponent with the last brick. In this case the opponent is your computer.

Orbyte Software
Expo Tic Tac Toe
16K RAM. Cassette: $14.95.

Computer age rendition of the old game. 4 boards to play on simultaneously. Outsmart the opponent (the computer) and get 4 X's in a row. Computer calculates best place for the answer while blocking you.

Rave Research
Game Tape
16K RAM. Cassette: $10.95.

Tired of playing against the computer? Checkers: The computer is used to draw the board, move the pieces, keep score, and announce the winner. 6 Dice: Any number can play; computer keeps track. Includes a very fast Big Letter routine.

Savage Software
Monopoly
16K RAM. Cassette: $14.95.

Old favorite monopoly game. Up to 6 players, including Grandma. The computer tracks properties, bank balances, houses, and hotels owned by all players. A total family game. Your choice of language version: Spanish, British, or American.

Paul Shreeve Software
Wordsearch
16K RAM. Cassette: $10; Listing: $2.50 (inc. s&h).

This program generates word search puzzles from words input by the user. It prints out a copy of the puzzle if a printer is connected.

Smartware
ZX Yahtzee
16K RAM. Cassette: $9.95.

The classic dice game of strategy and luck, played on a computer. One to four players.

Software Development Associates
Football
16K RAM. Cassette: $9.95.

An enjoyable game of college football for 1 or 2 players. You select from 1 of 7 offensive plays and the computer sets the defense, and determines the outcome.

UAS
Cribbage. (C2000).
16K RAM. Cassette: $14.95.

The game follows the standard rules for the game as can be found in any good card instruction book. Two levels of play are available: 60 and 121 points. The computer will shuffle, deal, and cut for who goes first, generate the upcard, keep track of the score, and credit all points as they are earned. The total card play is displayed and playing prompts are also displayed.

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Educational programs are on cassette, menu-driven and require 16K.

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Zeta Software
Revers1
16K RAM. Cassette: $17.45.
A Basic/machine language, 8 x 8 square version of "I Go," the Japanese strategy game. Features include: 10 skill levels, 3 player modes, fast ML computer moves, and rated possible move displays.

Snake
16K RAM. Cassette: $12.45.
A fascinating game in machine language with 65,000 possible combinations of snake-speed and mouse freeze time. The object is to guide the snake, eat mice, and avoid walls.

Chess

Arizoftx
Chesslab5.0
16K RAM. Cassette: $19.95 plus $2 s&h.
An analytical and recordkeeping system for chessplayers; not a game program. *Chesslab5.0* displays a chessboard upon which pieces can be moved, eight positions stored and recalled, sixteen commands provide flexibility. *Filetape5.0* (included) permits storage on tape of six positions per file.

Gladstone
Chess I (Enhanced) (Z85)
16K RAM. Cassette: $14.95.
Displays board and moves; 6 levels of play, 2 within competitive time limits. Choose black or white. Plays all legal moves including castling and en passant. Save games in progress. Output to printer. Change sides in middle. Clear board with one command. Totally in MC.

Chess II (Master) (Z86)
16K RAM. Cassette: $24.95.
All the features of ZX Chess (Z85), plus much more. 7 levels, 4 within competitive time limits. Computer will suggest moves. Book with 32 opening moves. We believe it the strongest chess game available for the ZX81.

1K Chess (ZX81) (Z87)
1K RAM. Cassette: $9.95.
A good introduction to chess even within this limited memory space. Full graphic representation of the board. Does not accept castling or en passant moves. 1 level of play.

2K Chess (TS1000) (Z55)
2K RAM. Cassette: $14.95.
Improved chess game with better graphics and superior range of moves.

Graphicomp
Chess 1.4
16K RAM. Cassette: $14.95.
A full feature chess game offering 10 levels of skill, graphics display, and hardcopy for ZX printer. At any time during the game a player can change sides or save the game for future play. By Abersoft.

Kopak Creations, Inc.
Chess and Chess Clock
16K RAM. Cassette: $14.95.
A chess game providing at least 6 levels of play; written totally in machine code.

Softsync, Inc.
Superchess
16K RAM. Cassette: $19.95.
Probably the most advanced chess game available for the TS1000/ZX81. Ten levels of play; tactical or positional evaluation; analyze feature allows you to set up and/or change a position; a store of standard openings; excellent board display; up to 15 previous moves displayed; will recommend moves; self play allows you to watch Superchess play against itself. (Licensed from CP Software.)

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HERE'S HOW TO SAVE HOURS - WITH OUR PROGRAMMING AND HARDWARE HINTS.
HERE'S HOW TO SAVE WEEKS - BY GOING TO THE DEALERS WE RECOMMEND FOR QUICK DELIVERY.
HERE'S HOW TO SAVE $100'S - BY READING OUR COMPARATIVE REVIEWS OF BOOKS, SOFTWARE, AND HARDWARE.
HERE'S HOW TO GET INSTANT HELP AND INFO - BY CALLING THE HOTLINE FOR SUBSCRIBERS.

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TS USER IS THE NEWSLETTER FOR USERS OF TIMEX AND SINCLAIR MICROCOMPUTER PRODUCTS ONLY. EACH MONTH YOU GET A NEWSLETTER PACKED FULL OF::::::::::::
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* K'S AND K'S OF APPLICATIONS, HINTS, AND GOSSIP.
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* USER EVALUATED INFO - PLUS, PLUS.

HERE'S HOW TO SAVE $100'S A YEAR FOR AROUND A QUARTER A WEEK::::::::::::

Extending, continued...

CRC Software
CRC Smart Soft Face. $109.95.
Interfaces printers to the Sinclair; serial; parallel; uses no RAM; no USR routines; any printer; single key operations.

DCP Microdevelopments Ltd.
DCP Interspec Pack. £39.95.
Complete interface pack for ZX81 or Spectrum. Contains: 8 bit 8 channel A-D converter, 4 relays, 4 switch inputs, 8 bit input port and 8 bit output port. Also DCP bus at rear of unit for other addons. Fully cased and assembled with manual.

Data-Assette
Jigsaw Tape Load Interface (ZX22). $39.95.
Power Driven Cassette Loading Interface. Easy and reliable loading of information. Device detects incoming signals and automatically adjusts to level of that required by the computer. Red and Green LEDs give a positive indication as to whether or not the program is loading. Powered directly by the computer's adapter.

ZX-21 Metered Loading Interface. $19.95.
Vu Meter allows you to preset your tape recorder to a level that is compatible with your computer, gives you a visual indication of the power of your signal. Also available is a "Test Alignment Tape" and a booklet "The Microcomputers Users Book of Tape Recording."

ZX98 Parallel and Serial Interface. $99.95.
Both Parallel and Serial on one board. Turn your computer into a terminal for ON-LINE services or use it to communicate to other computers. Interface with any printer having a parallel or serial port. Several unique features include LLIST, LPRINT, COPY, and MEMORY EXAMINATION of HEX BYTE.

Down East Computers
VOTEM
Kit: $39.95 plus $3 s&h.
Assembled and tested: $59.95 plus $3 s&h.
Analog Interface and Tape Signal Conditioner. 1K and up. Hardware/Software package to measure voltage and temperature. Voltages: 0 to +1V (expandable). Temperatures: -25 to +125C. Extremely sensitive (high resolution): 0.00004V or 0.05C. Computer becomes "smart" voltmeter or digital thermometer with storage. No modifications required. Connects to tape input. 35-page User's Manual, cable, and temperature probe. Documentation alone: $5 (applied to first unit).

Temperature Probes for VOTEM. $5 pp.

Ener-Z Co.
Report Generator
$69.95 plus 3 s&h.
Data acquisition and control. Standard Centronics printer interface. CMOS real time clock calendar with batter backup. 8 bit parallel I/O ports. CMOS A/D converter. Features: Bus connector for RAM pack; machine code listings included; I/O mapped. Assembled and tested.

Gladstone
Memotech
Memopak Centronics Type Parallel Printer Interface (A71). $104.95.

Interface Innovations
Screenmate.
1K RAM. $49.95.
Offers two exciting and useful accessories in one peripheral: an attractive light pen and an Atari joystick interface. Complete with "piggyback" feature.

Inverse Video Module. $12.
Solders inside case, permits normal black on white or inverse video on black. From Haven Hardware.

K-2 Electronics
Kradle. $195 plus s&h.
Compact, low-profile metal case that fits around your assembled computer, adding 64K of low power RAM (all usable); a 50-key comfort sized keyboard with better layout, feel, and "click"; other refinements. Includes: space bar, 9 autoshift keys, joystick connector, cassette read enhancer, pilot light, bus expansion connector. Introductory price.

Kradle Communicator. $75.
An add-in expander for the Kradle, providing RS232 and printer/output ports, communication to modem or remote computer plus standard parallel output (8 bit) port with handshaking, hardware UART, software BAUD select, vectored interrupt capability. Requires no memory space; I/O mapped.

Macronics Systems Limited
F.I.Z. Floppy Interface for ZX81 Disk System
£79.95 plus $1.50 s&h.
Enables S.A. 400 disk drive to be operated from the ZX81. Provides disk routines on ROM plus 2K RAM buffer. All routines operable from within program. Chaining is possible. True random access data files supported. Works with 16K RAM and Memotech 64K RAM.

Memotech Corporation
Memopak Centronics Parallel Interface. $104.95.
The Memopak Centronics Parallel Printer Interface enables your TS1000 to use a wide range of compatible parallel printers. The resident software in the units gives the complete ASCII set of characters, provides lower case character capabilities and up to 80 column printing.

Midwich Computer Co., Ltd.
Joystick and Controller. $14.95-33.85.
Analogue type joysticks plug into controller board which fits expansion slot of ZX81 or Spectrum.

Joystick. $19.95.
Switch type joysticks (pair) and interface unit to keyboard entry for games.

R. M. Norris
Joysticks. Plans only: $3.
Complete plans and a program. Does not include Atari joystick.

Professional Electronics
I/O Board
16K RAM. Board, programs, and instructions. $45.
Programmable 8255 PIO board for TS1000/ZX81. Can be used with three ports out, or two out and one in. One port is bit-programmable; programmable output device-select (1 usec. neg. pulse) lines are available for expansion.

Centronics-style Printer Interface
Cassette programs, extra 8K CMOS RAM board, and instructions: $60.
Printer interface uses ports A and B of the I/O board. Primary printer used is the Axiom GP-100A. Printer commands and ML programs are stored in an 8K memory area not used by computer. Prints listings, screen copies, ML code, labels, etc. Professional Electronics I/O board required.

Random Access
DVC-2 Direct Video Kit
DVC-2 Kit: $18.95 plus $1.50 s&h. DVC-2A, assembled version: $29.95 plus $1.50 s&h.
Kit enables the ZX81 to drive a video monitor. It provides switch selectable normal or reverse video (white characters on black background). Small circuit board fits inside the computer case. R.F. modulation is unaffected.

HDM-12 b/w video monitor
$89.95 plus $8.50 s&h.
12 inch video monitor provides super sharp character definition. Input impedance is 75 ohms; accepts standard NTSC composite video via an RCA type connector. Requires the DVC-2 direct video kit to interface with the ZX81.

Input/Output Port
Built: £13 plus s&h.

24 lines input or output or mixed. Controlled using Basic. Plugs into the motherboard.

Redditch Electronics
Input/Output Port
£16.48 plus s&h.

24 lines input or output or mixed. Controlled using Basic. Printer and RAM pack plug onto the back.

Motherboard
£13.04 plus s&h.

Plugs into the back of ZX81 or ZX80. Printer/RAM pack plugs onto back. Has two female connectors to accept expansion boards.

Timer/Counter/Music Board
£16.48 plus s&h.

Three programmable counters. Controlled in Basic. May be used as timer, counters, or frequency generators (including audio range).

Redditch Electronics
Female Connectors £2.50 plus s&h. Male Connectors £1.60 plus s&h.

A doublesided male connector which plugs into 23 way female connectors. Will connect 2 females together, or ribbon cable may be soldered on.

Digital To Analogue Converter
£15.22 plus s&h.

Fits onto input/output port to give one analogue output (0 to 2.55 volts); space on board for two extra converters (£6 each).

G. Russell Electronics
Winky Board II
Any size RAM. Assembled: $24; kit: $18.

This tiny (1" x 1 1/2") interface lets you: 1) Filter RAMPAC noise when SAVEing for clean, easy LOADing tapes. 2) Duplicate any ZX/TS cassette program—even normally unSAVEable cassettes. 3) SAVE on two cassettes simultaneously. 4) Earphone-eavesdrop, set optimum tape volume instantly, and filter LF interference for easy LOADing.

Sensible Technical Solutions
Sensible Technical Solutions (Division Sema J Corporation)

Send SASE for more information. Send cash or money order (checks take a minimum of two weeks). Make all payments payable to S.T.S. (Division of Sema J Corp.). All prices include shipping, handling, and sales tax.

Easy Z Mount (327). $5.

Are your plug-in accessories a problem for you??? Piggy back as many as 3 modules steady as a rock. Material furnished to allow you to attach up to 3 modules with no further loose mounting problems. Also allows for quick mounting or removal (approx. 1 minute) of your modules.

Sinclair Place
Light Pen. $39.95.

For TS2000. Plot, draw, erase, modify, save. From dk'tronics.

Programmable Character Generator. $49.

Standard letters; inverse characters may be mixed or interchanged with 2 sets of programmable characters. 8 x 8 matrix. Written by 8 POKE commands. 5 internal connections. Edge connector free for plugons. From Haven Hardware.

Parallel I/O Port. $28.

Plugs on rear connector between computer and RAM pack. Configured as 8 inputs and 8 outputs with LEDs for all outputs. Onboard clock. From Haven Hardware.

23 Way Edge Connector. $6.

Female; gold plated with locator, solder on tabs. From Haven Hardware.

46 Way Edge Connector. $8.50.

Double female 23 way connectors. From Haven Hardware.

SOUND EFFECTS ★ MUSIC & TWO JOYSTICK - I/O PORTS

The ARCADE MASTER..... A&T $64.95
Plug-in Module for ZX81 and TS1000

Now you can create complex arcade quality sound effects, write melodies in 3 part harmony, & control the action with one or two Atari compatible joysticks *(not included)*.

- 3 tone generators - 8 octive range
- 3 channel mixer, amplitude controller, and envelope generator
- Noise generator

ALL INDEPENDENTLY PROGRAMMABLE!

- Internal speaker, volume control, and audio output jack
- Requires no additional power supply
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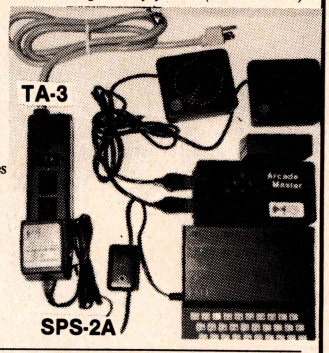
- Can be used with printer, 16K rampak, and most other modules
- Memory mapped so it can easily be programmed in basic using peel & poke
- User selectable to the start of any 4K memory location
- 2 Independent, TTL compatible I/O ports can be used as general purpose input/output, or with joysticks



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We are looking for great programs in all fields. We will publish your programs paying top royalties to you, if your programs are the best in their field and truely useful.

Extending, continued...

Repeat Key Module: $12.
Solders inside case. From Haven Hardware.

Teletype Interface
1K RAM and up. $30.
Hardware and software for driving 20ma teletypes. Machine code driver for screen copy and output drives for teletype supplied on cassette.

Olivetti Praxis Interface. $250.
Hardware and software for driving and receiving to and from an Olivetti Praxis typewriter. Screen editor under development.

Logic Analyser. $400.
8 channel 4MHz logic analyser. Word recognizer trigger. Post trigger and pre-trigger display, allows manipulation and storage of analyser data via the computer at low cost.

Tandy Colour Printer Interface.
16K RAM. $60.
Hardware and software driver for Tandy 4 colour plotter. Requires external +/- 12V supply at 100ma. Driver program supplied on cassette.

Software Lab East
The Troubleshooter Series
16K RAM.
The Troubleshooter Series consists of programs which use artificial intelligence to assist the user to troubleshoot radios, televisions, auto engines, stereos, record changers, tape recorders, and appliances. The programs also tell the user which test to conduct and which component to repair. Write for details.

The Software House
Joysticks
Plans and program: $4.
Plans, program, joystick: $25.
Detailed EZ to follow plans and program to use an Atari type joystick.

Spectra Computer Products
Heatsink. $7.
A no frills, fully functional heatsink that solves the system failures caused by overheating.

RAM Pack Stabilizer. $1; free with any purchase over $10.
A simple device to stabilize the RAM pack and other wiggley peripherals.

Techomatic, Ltd.
ZX Analogue to Digital Converter
16K RAM. £20.00 + s&h + VAT.
Analogue to Digital Converter allowing computer access to the "real world" such as temperature, sound level, voltage, position, speed, etc. Eight channels of analogue input data, each with a resolution of one part in 256, opens a whole new field of applications. Joystick input also accepted.

Thurnall Electronics
A-D Converter. POA.
A based 8 channel A-D converter, may be used for computer logging of voltages, temperatures, light levels, etc.

RS232 Interface. POA.
Used to drive printers, teletypes, etc. Full RS232 20MA interface with adjustable BAUD rate. Conversion software from Sinclair Basic to ASCII available.

TMR
Sensation
$149.95; price for boards varies. SASE for brochure.
A peripheral system for all Sinclair and MicroAce computers. Includes eight internal slots for expansion boards, and 5V power supply. Boards available are: Character Generator, Interrupt Controller, Real Time Clock, Sound and Music Generator, I/O Ports, Expanded Memory, etc.

Upstate Labs
I/O Ports and EPROM Programmer
Plans: $5.
Schematic documentation, parts lists, and software listing to build a 24 line I/O port and then use it to program: Intel 2716, 2732, 2732A, 2764 and Motorola MCM2716 EPROMs. The I/O port is based on Intel 8255A (also uses 1 ea.: 74LS30, 74LS32, 7404). The programmer uses only one IC (6N139).

Wisconsinc Electronics
Non-volatile Memory with I/O parts.
Kit: $79.
Unit provides 6 parallel I/O ports and accepts Timex 16K RAM pack. Also accepts up to four 2716 EPROMs, 2Kx8 static RAM, or nonvolatile X2816A EEPROMs. Powered by your computer or optional 2A power supply ($19).

32K RAM with I/O parts. $155.
Two 8-bit input and two 8-bit output parts ideal for peripheral or control applications. Ports-only unit ($50) may be upgraded later to 16K or full 32K RAM storage. Optional aluminum enclosure.

Zeta Software
Update
$2.50
Booklet. Information on how to hook up a popular game joystick. Includes table of possible keys enterable by the joystick and key code data to convert Scout Fighter to joystick.

Programming, continued...

Infrared
Spectrum 16K/48K RAM. £6.75 plus s&h.
Z80 disassembler. Complementary disassembler to *Ultraviolet*. 48K version can be used at the same time as *Ultraviolet* to give full machine code system.

Acsembler
16K RAM. £5.50 plus s&h.
Z80 assembler. All Z80 instructions are correctly assembled and listings can be output to the printer. Marketed in the US by Cleva Computer Ware.

Dis-Acsem
16K RAM. £5.50 plus s&h.
Z80 disassembler. Works alone or with assembler. All Z80 instruction are correctly disassembled and listings can be output to the printer. Marketed in the US by Cleva Computer Ware.

Aerco
DA-1 Disassembler
16K RAM min. $12.
High speed machine language disassembler displays Z80 machine code and requires only 2K of memory.

Bob Berch
The ZX Compiler
16K RAM min. Cassette: $25 pp.
A true compiler. Generates a machine code program from one written in an integer subset of Timex/Sinclair Basic. Easy to use. 22 commands, 12 functions, 256 16 bit variables, single DIM arrays. Resulting code may be located anywhere in memory. Significantly increases program speed. Two versions on one cassette for different memory set-ups. 20 page manual.

The ZX Assembler/Disassembler
16K RAM min. Cassette: $15 pp.
A complete machine code development package. 8K program resides above RAMTOP. Machine code is generated from assembly instructions entered in REM statements. Standard Zilog mnemonics. Pseudo-ops ORG, DATA, EQU, RESV, and END. Disassembler includes hex editor and single stepper. REM generator and binary SAVE/LOAD utilities. 16 page manual.

Bug-Byte Software
ZXAS
16K RAM. Cassette: $12.
Assembles all the standard Zilog mnemonics. When assembled, the assembly listings, together with assembled codes and addresses, are displayed on the

screen. Code executed by USR. Program occupies 5K at top of memory. Use the Z80 microprocessor without having to POKE. Full documentation.

ZXDB
16K RAM. Cassette: $15.

Complements *ZXAS* assembler; combined MC disassembler and debugging program; used with *ZXAS* leaving 9K RAM for programming. Features: DIS-ASSEMBLER, SINGLE STEP, BLOCK SEARCH, TRANSFER AND FILL, HEX LOADER, REGISTER DISPLAY and more; executed by one key commands.

Aspect Editor/Assembler
Spectrum. £9.

Aspect is a full editor and assembler package. Uses all the instructions supplied by Intel. Comprehensive set of pseudo-ops provided so that text etc. can be included in routines. Code is assembled at a fixed address, but can be made to execute at any address. Full screen editor with automatic checking. Full documentation.

Cleva Computer Ware
Acsembler
16K RAM. Cassette: $9.95.

2 pass assembler. For those who wish to write their own machine code programs. It is designed to run alone, or together with the dis-assembler, and/or the de-bugging program. These provide a system for writing, editing, checking and testing machine code programs.

Dis-Acsembler
16K RAM. Cassette: $9.95.

Allows you to read the ZX81/TS1000 ROM(16K). It is written specifically for the Sinclair/Timex computers, and, unlike some programs modified for Intel 8080 dis-acsemblers, it gives full Z80 mnemonics.

Gladstone
ZX Assembler (Z40)
16K RAM. Cassette: $14.95.

Full Editor/assembler and monitor. Labels may be used instead of any string. Features: Line insertion/deletion, insert characters, auto repeat on all keys. Monitor inspects memory, registers, and run MC programs. MC program occupies 7K at top of memory (From Artic Computing.)

ZX Bug (Z41)
16K RAM. Cassette: $14.95.

MC monitor and disassembler. Works in hex so addresses are a maximum of 4 hex bits long. 28 commands. 4K long; uses memory from 71E0 to top memory (From Artic Computing.)

Intercomputer Inc.
Mcoder (PT4001)
Cassette: $18.95.

Mcoder is the first compiler for the TS1000 and ZX81 computers. Give your Basic programs the speed of machine language programs by running them in compiled form. Simply write and debug your Basic program and run it through *Mcoder*. You will see it compiled on the screen and have the machine language version upon completion.

Kopak Creations, Inc.
Z-99 Compiler
16K/2K RAM. Cassette: $19.95.

Automatically codes 99% of Sinclair Basic into machine code.

Lamo-Lem Laboratories
ZX81 1K Disassembler
1K RAM. Cassette: $9.95.

Disassembler translates each Z80 machine code instruction into a unique key. Look up the key in the disassembler manual to find the assembly language mnemonic. Translates the 8K ROM, or programs of up to 150 bytes. Includes Memory Test.

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Programming, continued...

ZX80 1K Disassembler
4K ROM; 1K RAM. Cassette: $9.95.

Disassembler translates each Z80 machine code instruction into a unique key. Look up the key in the disassembler manual to find the assembly language mnemonic. Translates the 4K ROM, or program segments stored in a 75 byte section of memory. Includes Memory Test.

Super Z
4K ROM; 1K RAM. Cassette: $9.95.

Machine code program which adds 7 new statements to ZX80 Basic: TAB, SCROLL, MEM, PAUSE, READ, RESTORE, and DATA. All are stored in a 350 byte subroutine at line 0 and accessed with a USR call. Comes in a ziplock bag with demo program, manual, and 2 reference cards.

Martin Irons
"DA1" Disassembler.
12K. Cassette: $9.

Allows you to browse the powerful routines in ROM, check your own machine code by converting it to assembler statements; converts 812 regular and extended opcodes to assembler mnemonics; no external tables required; jump to any point in memory at any time. Instructions.

Mindware Inc.
From Eagle Sales
Machine Code Monitor
16K RAM. Cassette: $19.95 plus s&h.

Enter, run, and de-bug machine code programs independently of Basic commands. Enter and de-bug MC instructions; then test them in operation. Performs hexadecimal arithmetic, copies and moves blocks of data, converts between decimal and hex, examines and modifies locations in memory. Maintains a protected environment for its own system variables and displays. By Taurus Computer Design.

Oxford Computer Publishing Ltd.
Full Screen Editor/Assembler for Spectrum and TS2000.
16K & 48K RAM. Cassette: $19.95.

An essential tool for machine code writers, this program represents the state of the art in terms of full screen input, editing, and cursor control, plus 42 column display. Features include auto-line numbering, full expression evaluation, all Z80 mnemonics, text buffer, printer output, dec or hex input, all the normal assembler directives.

Scientific Software
TS1000/ZX81 Assembler/Debugger
Cassette: $14.95 pp; $19.95 outside US.

Two-pass, entire Z80 instruction set, Zilog mnemonics. Labels, symbols, seven pseudo-ops: ORG, DEFB, DEFW, DEFS, DEFC, EQU, END. Displays or prints listings. Assembles up to 1000 lines/minute with syntax checking, diagnostics. Debugging features include: memory display, modification in hex, breakpoint with display of all registers, line renumbering. Comprehensive manual. Program takes 6.5K in MC and Basic.

Sinware
Hot Z
16K RAM or more. Cassette: $19.95; EPROMs: $40; plus $2 s&h.

Machine language editor and disassembler that gives full screen Z80 assembly language listings with user-supplied labels. Provides full editing functions and debugging facilities with over 40 commands. Allows single stepping of machine programs with full Z80 register display. Loads or saves ZX tapes and gives printed listings.

Utilities Engineering
ROM Reader
16K RAM. Cassette: $12.45.

Translates the contents of the Sinclair Basic operating system into Z80 mnemonics, hexadecimal of codes, and "nn" data from the PEEKed decimal values.

Using, continued...

Intercomputer Inc.
Address Book (HM5003)
16K RAM. Cassette: $14.95.

Stores your entire address and phone list. Retrieves a list from partial, half-remembered information. Adds, changes, or deletes names. Will printout an entire list in alphabetical or zip code order, including mailing labels, in either order on a printer. Entries coded for special purposes, e.g., card list, will be printed by code.

R. A. Tec.
Address Book (BHBIO)
16K RAM. Cassette: $13.

Keep track of up to 100 names, addresses, and phone numbers per tape. Program is Menu and INKEY$ driven.

Smartware
ZX List
16K RAM. Cassette: $9.95.

This "mailing list/phone directory" program allows you to store the names, addresses, and phone numbers of up to one hundred people. Search for entries in a variety of ways.

Michael B. Williams
Information 1000
8K RAM or more. Cassette: $9.95.

Store a name, complete address, and phone number. Retrieve it later. Number of entries is limited only by free RAM. Provides search facility, output to printer, 10 options. Excellent for mailing lists.

Thomas B. Woods
ZX Phone Book
16K RAM. Listing: $4.95.

Directory holds 720 names; complete Add, Change, Delete functions, Autosaving, and more. Documentation gives a thorough, easy to understand introduction to data base programming techniques.

Math and Science

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J. R. Carr
Z Q-1
16K RAM. Cassette: $16.

Calculates: 1) Ohm's law for DC, X, Z, real and effective pwr and pwr factor. 2) X of C. 3) X of L. 4) X total. 5) Z series or parallel and phase angle. 6) Resources. 7) Circuit "Q" series or parallel, loaded or unloaded. 8) Circuit resistance at resources, series or parallel. 9) Solenoid coil design. In any routine, give it any two known quantities, and it will calculate the third.

Kimtech
Statistical Pac
16K RAM. $8.00.

The Pac consists of four programs plus documentation. These programs will perform chisquare (goodness of fit) calculations, analysis of a data set including hypothesis testing and confidence intervals, comparison of two data sets using hypothesis testing and confidence intervals, and simple linear regression including t-value and R^2.

Ksoft
TS-Art
16K RAM. Cassette: $12.95 (s&h: $1.50 U.S., $2.50 abroad).

A graphics program and a Logo-style educational tool that indirectly teaches concepts in arithmetic, geometry and computer science. Work with a pencil, eraser, about 120 brushes, a video inverser and a "flicker" by moving them in 8 directions or along circles and lines. Set any background. Define new graphics commands. Expand, compress or rotate. Save or print artwork.

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UAS
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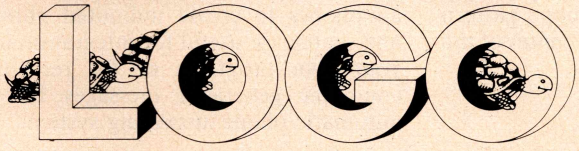

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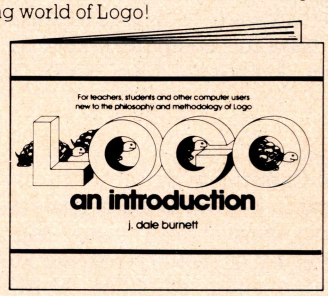

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Sinclair ZX Spectrum Desk Console
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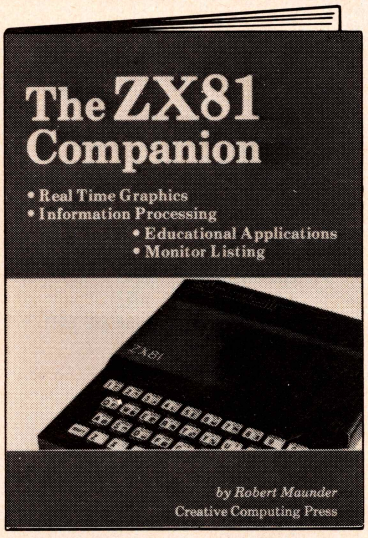

The ZX81 Companion
by Bob Maunder

The ZX81 Companion follows the same format as the very popular *ZX80 Companion,* and assists the ZX81 or Timex Sinclair 1000 user in four applications areas: graphics, information retrieval, education and games. This practical guide contains scores of fully documented short routines plus complete programs and a disassembled listing of the ZX81 ROM Monitor. "Thoughtfully written, detailed, and illustrated with meaningful programs." —MUSE

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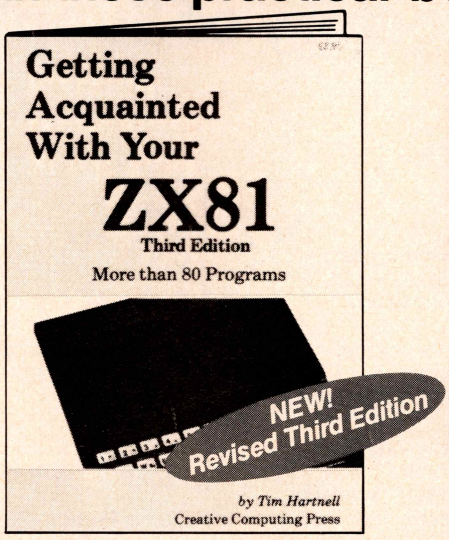

Getting Acquainted With Your ZX81
by Tim Hartnell

This informative volume for the new ZX81 or Timex Sinclair 1000 user contains more than 80 programs to help the reader get the most from his Sinclair computer. Game programs include Checkers, Alien Imploders, Blastermind, Moon Lander, Breakout, Star Burst and Derby Day. The book also shows programs for cascading sine waves, plotting graphs and tables, data sorting, equation solving, plus the use of PLOT, SCROLL, PRINT, TAB, PEEK, POKE and much more!

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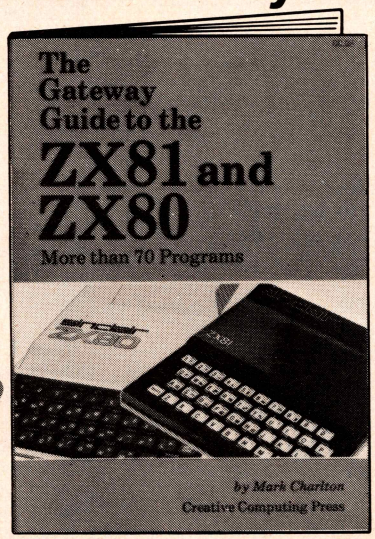

The Gateway Guide to the ZX81 and ZX80
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The Gateway Guide is a practical programming manual for the beginner that furnishes over 70 fully documented programs. The majority of the programs have been written for easy conversion from machine to machine (ZX81 or Timex Sinclair 1000, 4K ZX80 or 1K ZX80). *The Gateway Guide* describes each function and statement, illustrates it with a demonstration routine or program, and combines it with previously discussed material to help you understand your computer.

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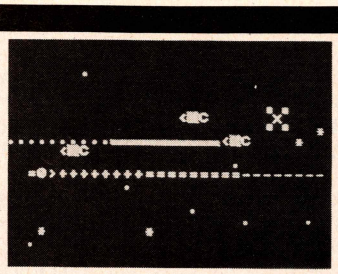

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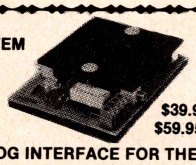

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